

Making Everything Easier!™

California Archaeology

FOR
DUMMIES

Learn to:

- Appreciate history's greatest archaeological discoveries
- Excavate a site, analyze findings, and draw conclusions
- Understand theories about the lives of early civilizations
- Pursue a career in archaeology

Nancy Marie White

Registered professional archaeologist



CALIFORNIA ARCHAEOLOGICAL CHRONOLOGY

PREHISTORIC

- | | | |
|----|-------------------------|--|
| 1: | INITIAL PERIOD: | 20,000-15,000 B.P. (ALASKA)
Peopling of North America |
| 2: | PALAEOINDIAN PERIOD | 12,000-9,000 B.P.
Clovis-Folsom
Big Game Hunting Tradition
Pleistocene Extinctions |
| 3: | EARLY ARCHAIC PERIOD | 9,000-5,000 B.P.
Great Basin Stemmed
San Dieguito
Lake Mohave
Early Millingstone Horizon |
| 4: | MIDDLE ARCHAIC PERIOD | 5,000- 3,000 B.P.
Early Horizon (Delta) |
| 5: | LATE ARCHAIC PERIOD | 3,000 B.P (1,000 B.C.)-A.D. 500
Middle Horizon (Delta)
Intermediate Period |
| 6: | LATE PREHISTORIC PERIOD | A.D. 500-1542
Late Horizon (Delta)
Canalino, Shasta Complex, etc. |

HISTORIC

- | | | |
|-----|-------------------------|--|
| 7: | PROTOHISTORIC PERIOD | A.D. 1542-1769
California Explored by Sea |
| 8: | SPANISH COLONIAL PERIOD | A.D. 1769-1821
California Colonized by Land
Presidios, Missions, Pueblos |
| 9: | MEXICAN REPUBLIC PERIOD | A.D. 1822-1847
Land Grants (Ranchos) |
| 10: | ANGLO-AMERICAN PERIOD | A.D. 1848-PRESENT
Gold Rush, Population Boom |

Archaeological Periods in Central California

<u>Period and Dating</u>	<u>Archaeological Site/Unit</u>
Upper Emergent A.D. 1500	Phase 2, Late Horizon
Lower Emergent A.D. 300	Phase 1, Late Horizon
Upper Archaic 2000 B.C.	Middle Horizon Intermediate Cultures
Lower Archaic 6000 B.C.	Early Horizon Early San Francisco Bay Early Milling Stone Cultures
Paleo-Indian 10,000 B.C.?	San Dieguito Western Clovis
Early Lithic ?	Farmington ? Santa Rosa Island ?

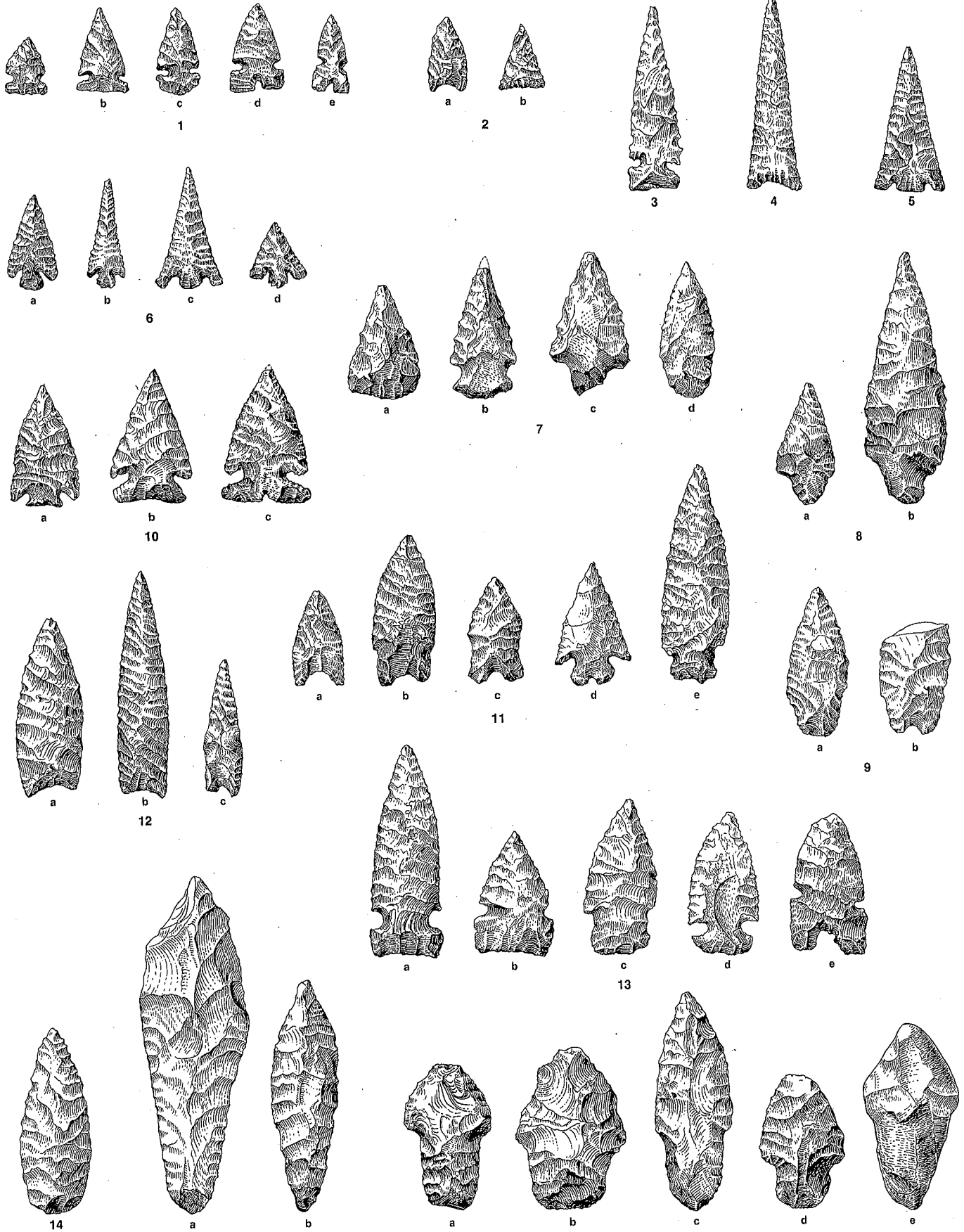
CENTRAL CALIFORNIA			SOUTHERN CALIF.	CALENDAR AGE				
SCHEME A1 ^a	SCHEME B1 ^b		SCHEME D ^c	SANTA BARBARA ^d	AD/BC	BP		
Historic	Historic		Historic	L3	1900	100		
Late Horizon Phase 2	Late Period	Phase 2	L2	L2b	1800	200		
Late Horizon Phase 1c				Phase 1c	L1	L2a	1700	300
						L1c	1600	400
		L1b	1500			500		
Late Horizon Phase 1b		Phase 1b	Middle/Late Trans.	L1a	1400	600		
				M5c	1300	700		
Late Horizon Phase 1a	Phase 1a	M4	M5a-b	1200	800			
			M4	1100	900			
Late Horizon Phase 1a	Middle/Late Trans.	M3	M4	1000	1000			
			M4	900	1100			
Late Horizon Phase 1a	Terminal Phase	M2	M3	800	1200			
			M3	700	1300			
Late Horizon Phase 1a	Late Phase	M1	M3	600	1400			
			M3	500	1500			
Late Horizon Phase 1a	Intermediate Phase	M1	M2b	400	1600			
			M2b	300	1700			
Late Horizon Phase 1a	Early Phase	M1	M2a	200	1800			
			M2a	100	1900			
Late Horizon Phase 1a	Early Phase	M1	M2a	0	2000			
			M2a	100	2100			
Late Horizon Phase 1a	Early Phase	M1	M2a	200	2200			
			M2a	300	2300			
Late Horizon Phase 1a	Early Phase	M1	M2a	400	2400			
			M2a	500	2500			
Late Horizon Phase 1a	Early Phase	M1	M2a	600	2600			
			M2a	700	2700			
Late Horizon Phase 1a	Early Phase	M1	M2a	800	2800			
			M2a	900	2900			
Late Horizon Phase 1a	Early Phase	M1	M2a	1000	3000			
			M2a	1100	3100			
Late Horizon Phase 1a	Early Phase	M1	M2a	1200	3200			
			M2a	1300	3300			
Late Horizon Phase 1a	Early Phase	M1	M2a	1400	3400			
			M2a	1500	3500			

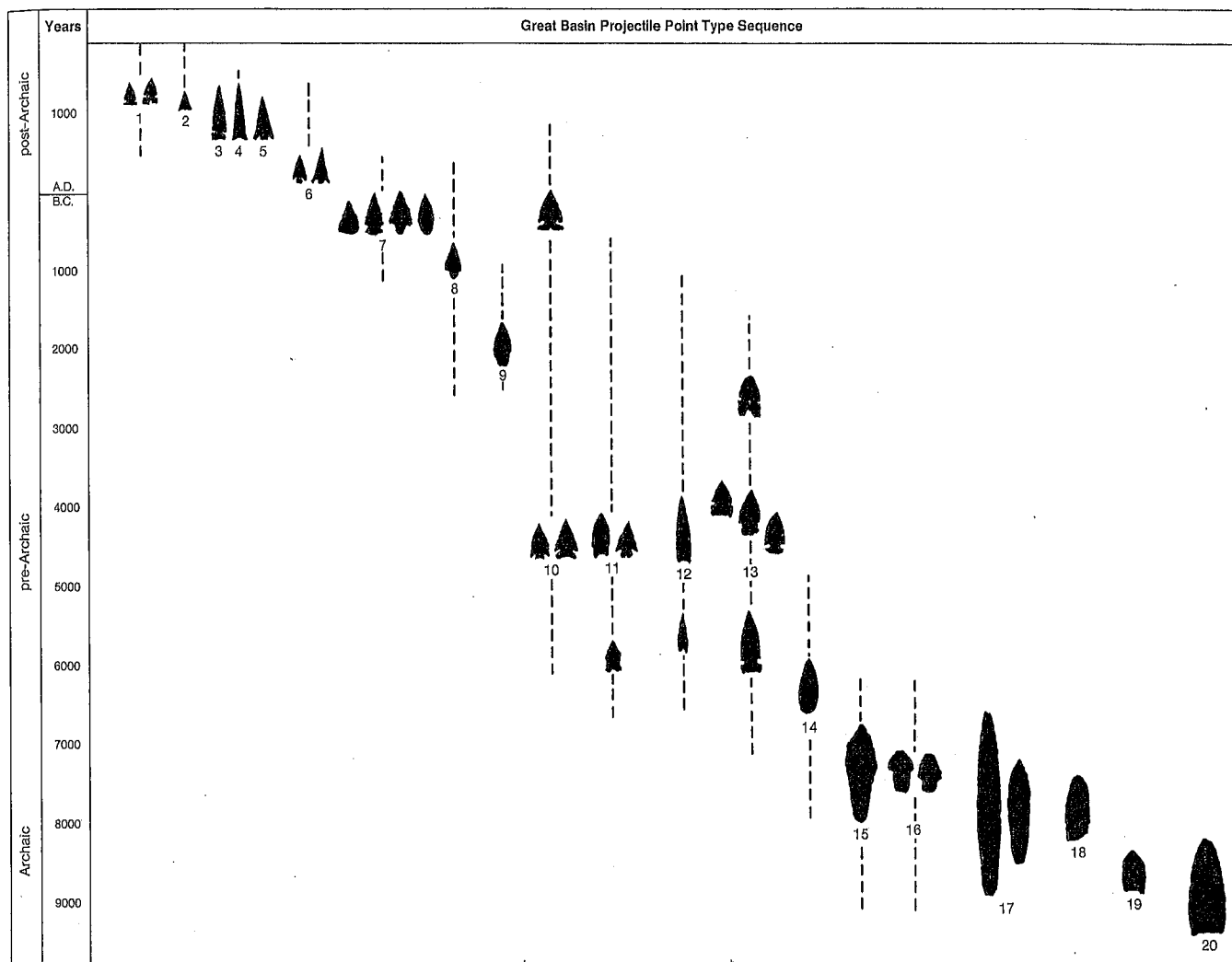
Figure 17.2. Concordance of recent central and southern California dating schemes.

^aScheme A1 derived from uncorrected terrestrial dates on archaeological assemblages from the early 1950s (Heizer 1958);

^bScheme B1 reflects uncorrected charcoal, bone collagen, and shell dates on seriated assemblages collected from the 1950s to the 1970s (Bennyhoff and Hughes 1987); ^cScheme D derives from direct dates on seriated *Olivella* shell beads, calibrated with on-line CALIB 4.4 using Delta R = 260 ± 35 (Groza et al. n.d.); ^dSanta Barbara Channel sequence derived from terrestrial dates on seriated assemblages, calibrated in the late 1980s (King 1990:20–22).

BSCN-4472



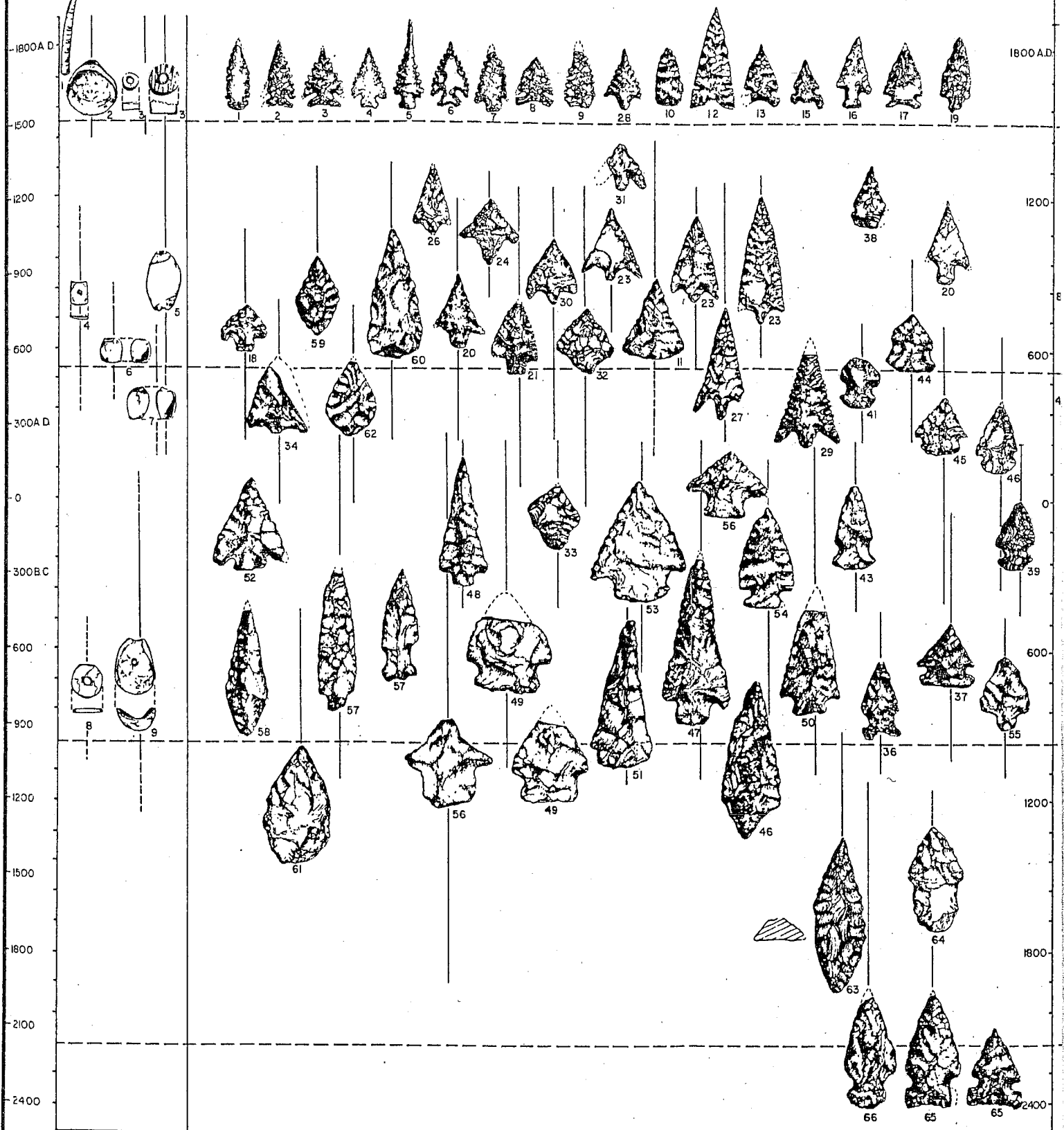


Type Name (Alternate Name)

- | | | |
|--|---|--|
| 1 Desert Side-notched Series
Desert Side-notched
Uinta Side-notched
Bear River Side-notched | 9 McKean Lanceolate | 13 Large Side-notched
Northern Side-notched
(Bitterroot Side-notched)
Hawken Side-notched
Rocker Side-notched
Sudden Side-notched
San Raphael Side-notched |
| 2 Cottonwood Triangular | 10 Elko Series
Elko Corner-notched
Elko Eared
Elko Side-notched
Elko Contracting-stem | 14 Cascade |
| 3 Bull Creek Concave-base | 11 Pinto Series
(Gatecliff Series, Little Lake Series, Bare Creek Series)
Pinto Square-shouldered
Pinto Sloping-shouldered
Pinto Shoulderless
Pinto Willowleaf | 15 Large unnamed stemmed |
| 4 Parowan Basal-notched | 12 Humboldt Series
(Great Basin Concave-base Series)
Humboldt Concave-base A
Humboldt Concave-base B
Humboldt Basal-notched
Triple-T Concave-base | 16 Large stemmed
(Great Basin Stemmed Series)
Lake Mohave
Silver Lake
Parman Series
Windust |
| 5 Nawthis Side-notched | | 17 Haskett 1 and 2 |
| 6 Rose Spring-Eastgate Series
(Rosegate Series)
Rose Spring Corner-notched
Rose Spring Side-notched
Eastgate Expanding-stem
Eastgate Split-stem | | 18 Scottsbluff |
| 7 Martis Series
Martis Triangular
Martis Corner-notched
Martis Stemmed-leaf | | 19 Folsom |
| 8 Gypsum | | 20 Clovis |

Fig. 3. Temporal distributions of recognized Great Basin projectile point types. Projectile point outlines are placed on dashed lines, representing temporal span, at the times of maximum popularity. This chart is a generalization; in any given area within the Great Basin, the types present and their temporal occurrence may vary.

SOUTHERN CASCADE FOOTHILL SHELL BEAD AND PROJECTILE POINT SEQUENCE



1. DENTALIUM
2. GLYCERMIS
3. CLAM SHELL
DISC A1A
A1C
4. RECTANGULAR
OLIVELLA
M1A
5. LARGE WHOLE
SPIRE LOPPED
OLIVELLA A1A
6. BARREL OLIVELLA
B2A

7. SMALL WHOLE
SPIRE LOPPED
OLIVELLA A1B
8. FLAT HALIOTIS
DISC H3A2
9. SCODP OLIVELLA
TYPE C5

*TYPES AFTER BENNYHOFF
AND FREDRICKSON 1967

SITE NO.
TEH-600
TEH-600
TEH-300
TEH-300
TEH-300
TEH-300
TEH-300
TEH-290
TEH-600
TEH-290
TEH-600

ACTUAL DATE
1750 A.D.
1405 A.D.
1330 A.D.
1260 A.D.
1200 A.D.
830 A.D.
570 A.D.
490 A.D.
410 A.D.
100 A.D.

C14 DATE
200
545±95
620±80
690±90
750±90
1120±100
1380±135
1460±100
1540±130
1850±125

C14 LAB NO.
GX-2873
GX-2875
GAK-2636
GAK-2637
GAK-2638
GAK-2639
GX-5669
GX-2876
GX-5570
GX-2874

DEPTH
10-20CM
100-110CM
10-20CM
30-40CM
60-70CM
100-140CM
50-60CM
50-60CM
160-170CM
110-120CM

Figure 1
Sequence

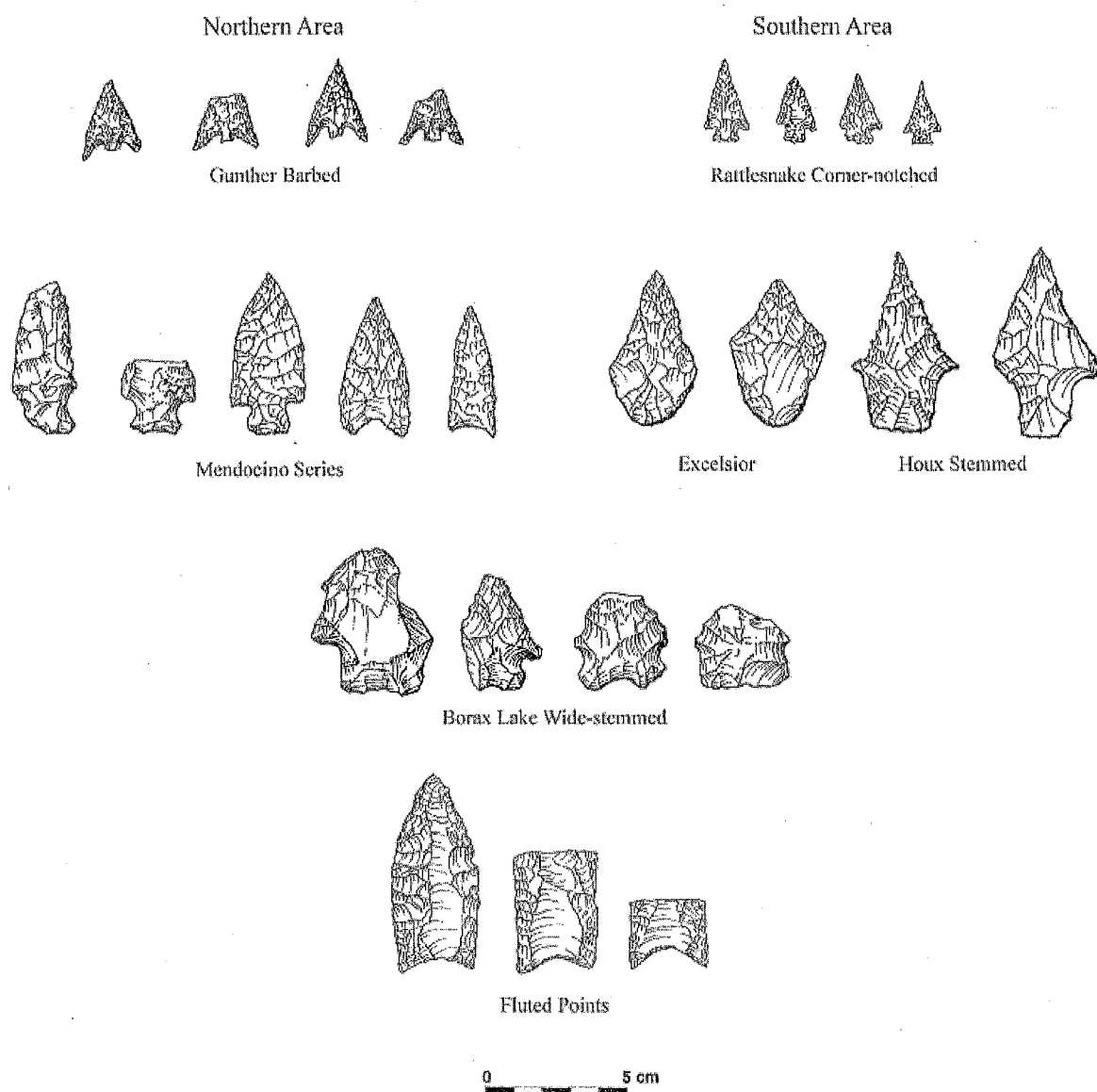


Figure 7.5. Projectile point sequence for northwest California.

Faunal and floral remains have not been discovered in these northern sites, largely because conifer leaf litter and heavy rainfall compromise the preservation of subsistence remains. The composition and homogeneity of the Borax Lake artifact assemblages, however, appear to represent a “forager” approach to subsistence-settlement organization. With this strategy, little emphasis is placed on storage, and incongruities in the distribution of resources over time and space are solved by moving people from places of declining productivity to areas where foraging opportunities are enhanced. This approach requires frequent residential moves by the entire social unit, resulting in the generalized assemblages and

homogeneous settlement structure observed in the archaeological record.

The Borax Lake Pattern is also well represented farther south in the Clear Lake basin (White et al. 2002), the mountains of Mendocino County (MEN-1711; Huberland 1989), and the Santa Rosa Plain (SON-20; Origer and Fredrickson 1980). Unlike the northern sites, Clear Lake assemblages are represented by flaked stone only, including large wide-stemmed points (square bases, some with fluting), ovoid flake tools, and thin bladelet flakes. Obsidian hydration data indicate these materials might be older than those to the north, as they appear to range between 8500 and 6000 cal B.C. It remains an open question as to

Geological Period	Early Holocene			Middle Holocene			Late Holocene																
Economic Period	Paleo	Lower Archaic						Middle Archaic			Upper Archaic					Emergent							
Shell Bead Period (Scheme D)	Early Holocene										Early Period							Middle Period				Late Period	
	11,000	10,000	9,000	8,000	7,000	6,000	5,000	4,000	3,000	2,000	EMT	M1	M2	M3	M4	MLT	L1	L2					
Time Line B.P. ^a																		500					
North Bay Patterns ^b	Post Pattern																						
Tomas Bay ^c	unknown	(Son-348)			undesignated		(Son-348, 1735, 2378)																
Santa Rosa ^d																							
Napa Valley ^e																							
Central Bay Patterns ^f																							
Marin Bay shore																							
Central Bay shore																							
East Bay Interior																							
South Bay Patterns ^h																							
S. Clara Valley																							
S. Mateo Coast																							
Time Line B.P.	11,000	10,000	9,000	8,000	7,000	6,000	5,000	4,000	3,000	2,000													

Note: ^a Time periods here are based on calibrated radiocarbon dates and absolute time, causing the Pleistocene/Holocene divide to shift from 10,000 to 11,500 B.P.; ^b North Bay patterns follow White et al. (2002), who has modified Fredrickson (1973); ^c Tomas Bay aspects follow Beardsley (1954) with components at Durcans Landing noted (Kennedy 2005); ^d Santa Rosa aspects follow Fredrickson (1989); ^e Napa Valley aspects follow Fredrickson (1984-515); ^f Central Bay aspects follow Bennyhoff (1994c:74); ^g Marin bayshore Upper Berkeley Pattern components suggest a complex of Ellis Landing and McClure Aspect elements (Goerke and Cowan 1983:63); ^h Patterns and aspects in the South Bay, encompassing San Jose, Santa Teresa, and Point Año Nuevo localities, are from Hykema (2002); ⁱ Early Bay Complex is distinguished at University Village site (SMA-77) because it mixes central bay Stage Aspect (Ala-307) ornaments and tools with a flaked tool assemblage typical of the south bay Sandhill Bluffs Aspect.

Figure 8.4. Concordance of archaeological time periods, patterns, and aspects in the San Francisco Bay Area.

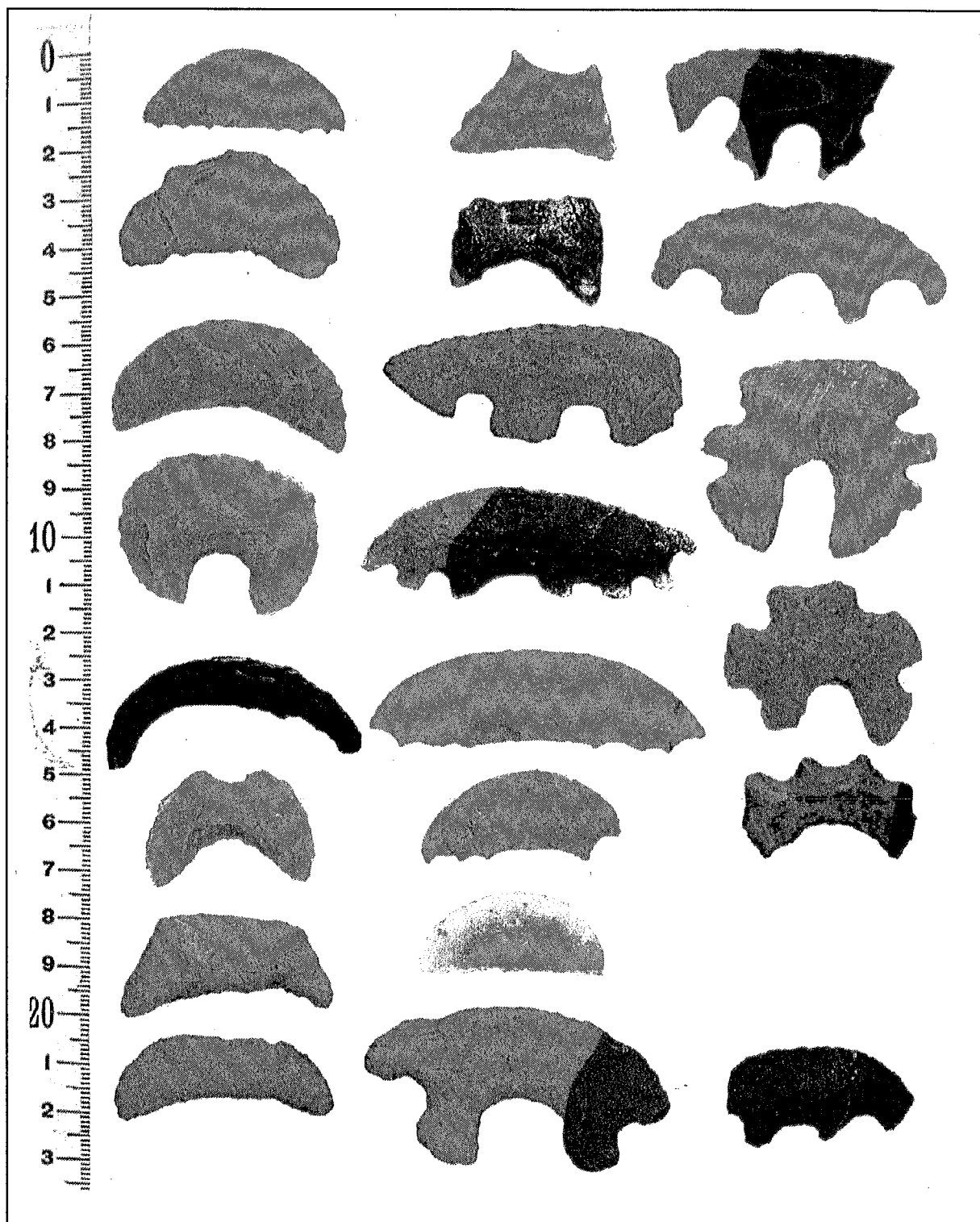
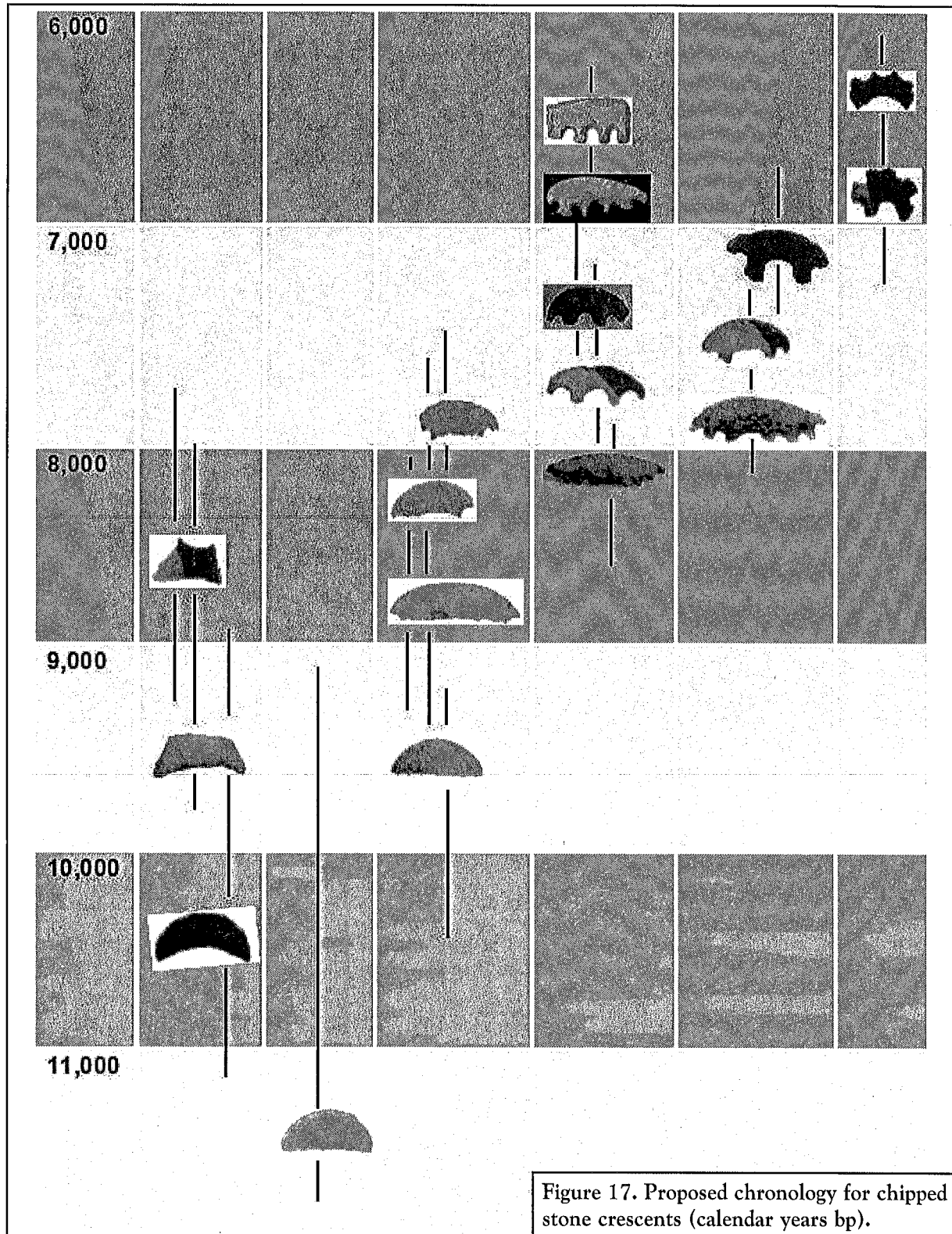


Plate 2. Mohr's crescent typology. Crescent types are arranged numerically from top to bottom, left to right. (Note Type #1 and Type #14 are transposed).



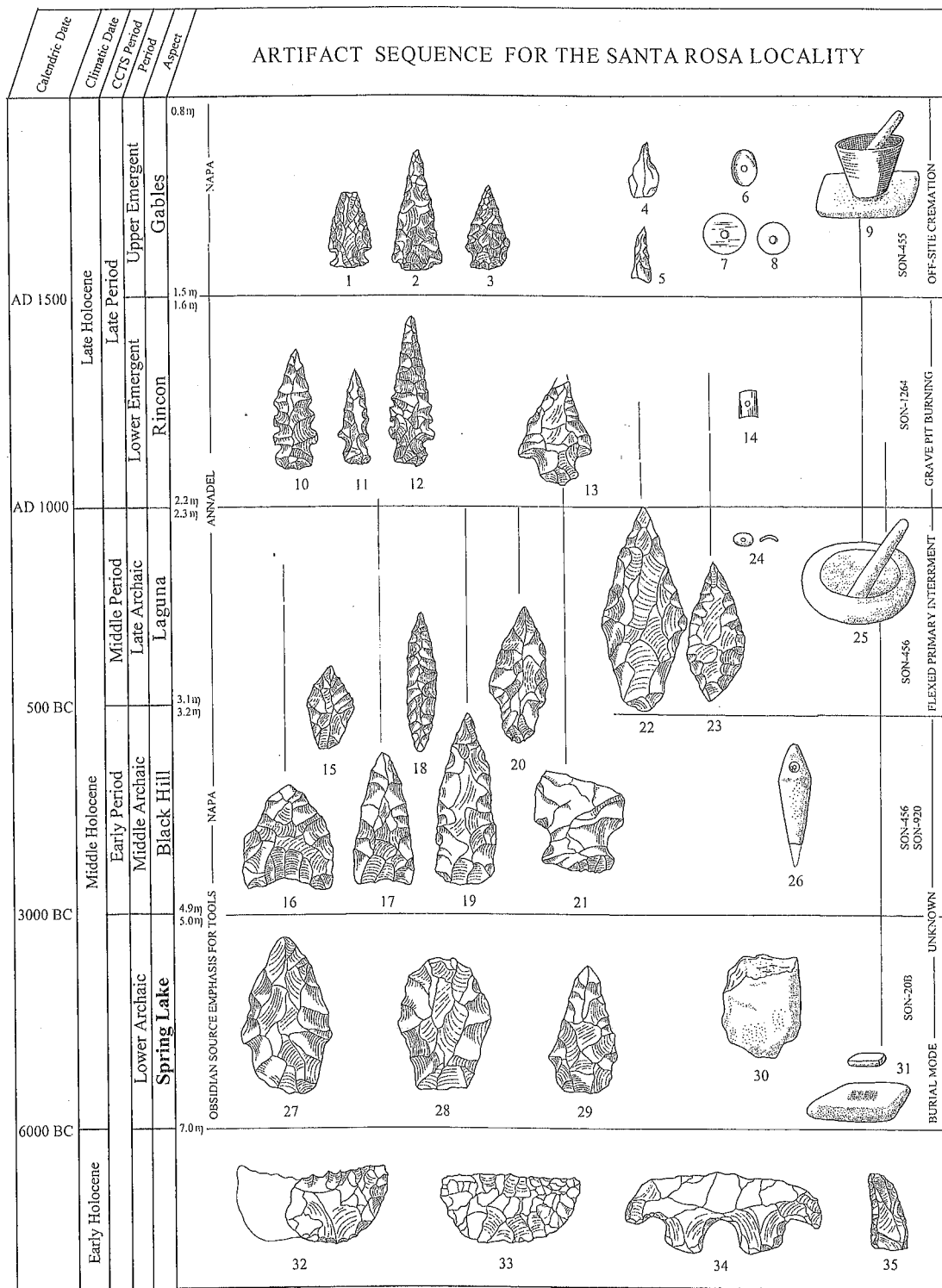


Figure 8.5. Artifact sequence for the Santa Rosa Locality. Key: (1–3) obsidian corner-notched arrow points; (4–5) chert bead drills; (6) *Olivella* lipped bead; (7–8) clamshell disk beads; (9) hopper mortar and pestle; (10–12) obsidian serrated, corner-notched projectile points; (13) side-notched spear point or hafted knife; (14) *Olivella* rectangular bead; (15) obsidian small, diamond-shaped projectile point; (16–17) obsidian (or chert) concave-based projectile points; (18) obsidian (or chert) narrow, leaf-shaped projectile point; (19–20) chert stemmed projectile points; (21) chert side-notched spear point or hafted knife (chert earlier, obsidian later); (22–23) obsidian shouldered, lanceolate projectile points; (24) *Olivella* saddle-shaped bead; (25) bowl mortar and pestle; (26) blue schist charmstone (biconically drilled); (27–28) obsidian wide-stemmed projectile points; (29) obsidian small-stemmed projectile point; (30) basalt unifacial cobble tool; (31) millingslab and handstone; (32) obsidian (Napa) butterfly form crescent; (33) chert lunate form crescent; (34) chert zoomorphic form crescent; (35) high-quality chert unifacial tool. (Only projectile points drawn to relative scale. Drawings by Nelson Thompson.)

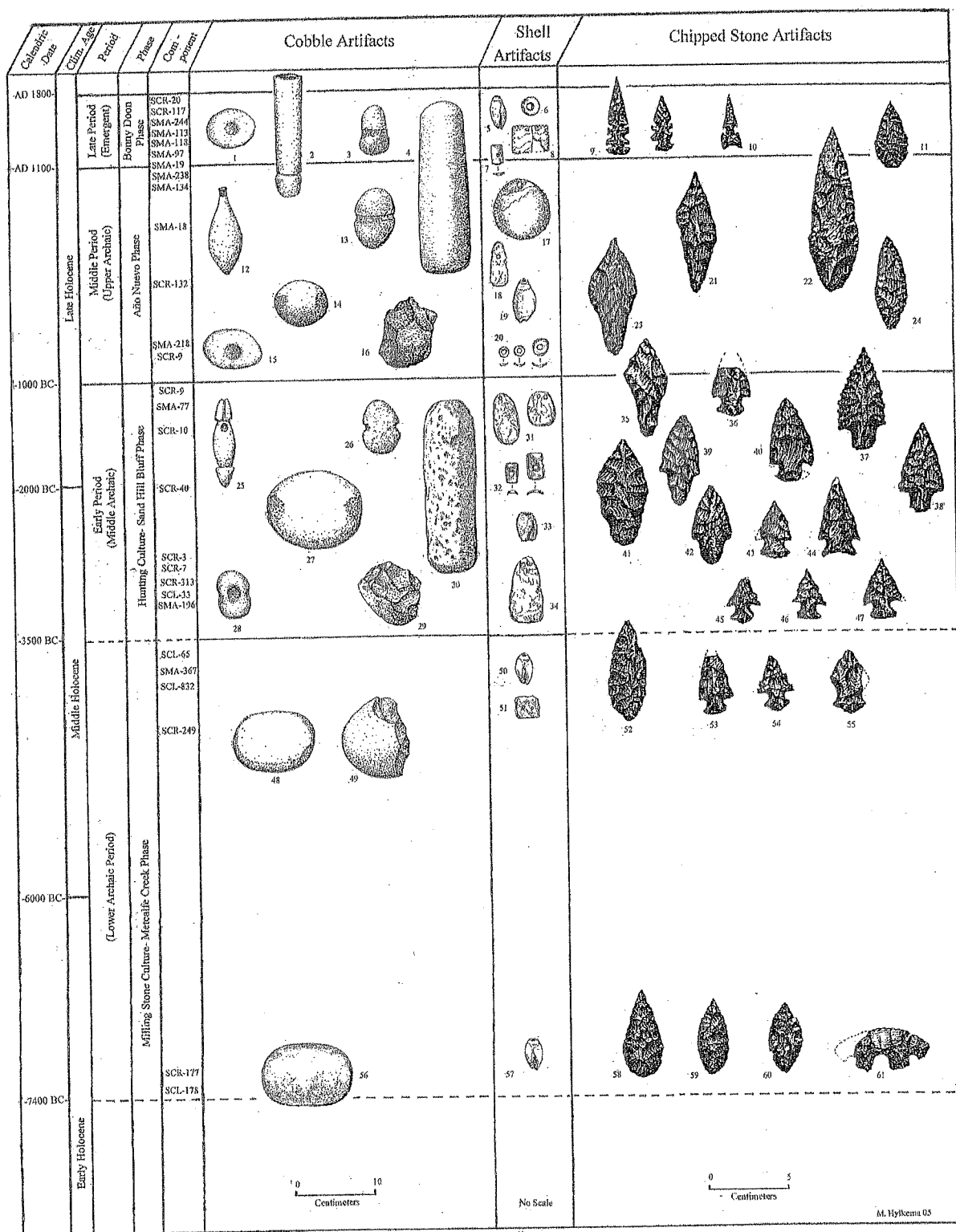


Figure 8.6. Artifact sequence for the San Mateo coast and Santa Cruz Localities.

Key: (1) sandstone bi-pitted cobble, SMA-134;
 (2) chlorite schist tobacco pipe, SCR-117;
 (3) Andesitic grooved sinker, SMA-238;
 (4) sandstone pestle, SCR-20;
 (5) *Olivella biplicata* type A1 series bead, SMA-244;
 (6) steatite disk bead, SMA-244;
 (7) *Olivella* M1a thin rectangle bead, SCR-20;
 (8) *Haliotis* type RC5e ornament SMA-238;
 (9) Napa obsidian Stockton-serrated points, SMA-244;
 (10) Monterey chert desert side-notched point, SCR-20;
 (11) Napa obsidian lanceolate point, SMA-134;
 (12) Andesitic pitted chert, SCR-132;
 (13) sandstone grooved sinker, SCR-132;
 (14) granitic shaped handstone, SCR-132;
 (15) sandstone bi-pitted cobble, SCR-132;
 (16) basaltic cobble chopper, SMA-218;
 (17) *Haliotis* type CA3h ornament, SCR-10;
 (18) *Haliotis* type OB3 ornament, SCR-9;
 (19) *Olivella biplicata* type A1 series bead, SMA-18;
 (20) *Olivella biplicata* type G series beads, SMA-218;
 (21) Monterey chert Año Nuevo long-stemmed point, SCR-9;
 (22) Napa obsidian lanceolate point, SMA-97;
 (23) Monterey chert Año Nuevo long-stemmed point, SMA-218;
 (24) Napa obsidian lanceolate point, SMA-18;
 (25) serpentine perforate chert, SCR-93;
 (26) sandstone edge-notched sinker, SMA-77;
 (27) granitic handstone SCR-9;
 (28) granitic bi-pitted cobble, SCR-7;
 (29) quartzitic cobble chopper, SCR-7;
 (30) sandstone pestle, SCR-40;
 (31) *Haliotis* type SC3 and FA5 ornaments, SMA-77;
 (32) *Olivella biplicata* L series rectangle beads, SMA-77;
 (33) *Olivella biplicata* type B series barrel bead, SCR-38;
 (34) *Haliotis* type OK5 ornament, SMA-77;
 (35) Monterey chert Año Nuevo long-stemmed point, SMA-218;
 (36) Monterey chert notched point, SCR-9;
 (37) Franciscan chert Rossi square-stemmed point, SCR-9;
 (38) Monterey chert Rossi square-stemmed point, SCR-7;
 (39) Monterey chert shouldered contracting-stemmed point, SCR-40;
 (40) chalcedony notched point, SCR-7;
 (41) Monterey chert contracting-stemmed biface, SCR-7;
 (42) Monterey chert shouldered contracting-stemmed point, SCR-7;
 (43-47) Franciscan chert notched points SCR-7;
 (48) sandstone handstone, SCL-65;
 (49) quartzitic cobble chopper, SCR-177;
 (50) *Olivella biplicata* A1 series bead, SCL-832;
 (51) *Haliotis* type H2a bead, SCL-832;
 (52) Monterey chert biface, SMA-196;
 (53) Monterey chert notched point, SCR-249;
 (54) Monterey chert notched point, SCR-313;
 (55) Monterey chert notched point, SCL-65;
 (56) sandstone handstone, SCL-178;
 (57) *Olivella biplicata* type A1 series bead, SCL-178;
 (58-60) Monterey chert lanceolate points, SCR-177;
 (61) Monterey chert eccentric crescent, SCR-177.
 (Some artifacts not drawn to scale. Artifacts depicted are represented at multiple sites. Drawings by Mark G. Hylkema.)



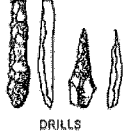


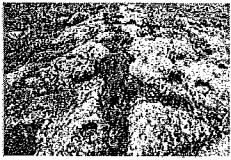










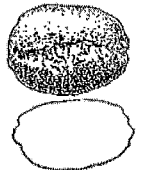




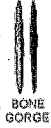











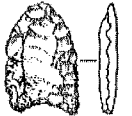
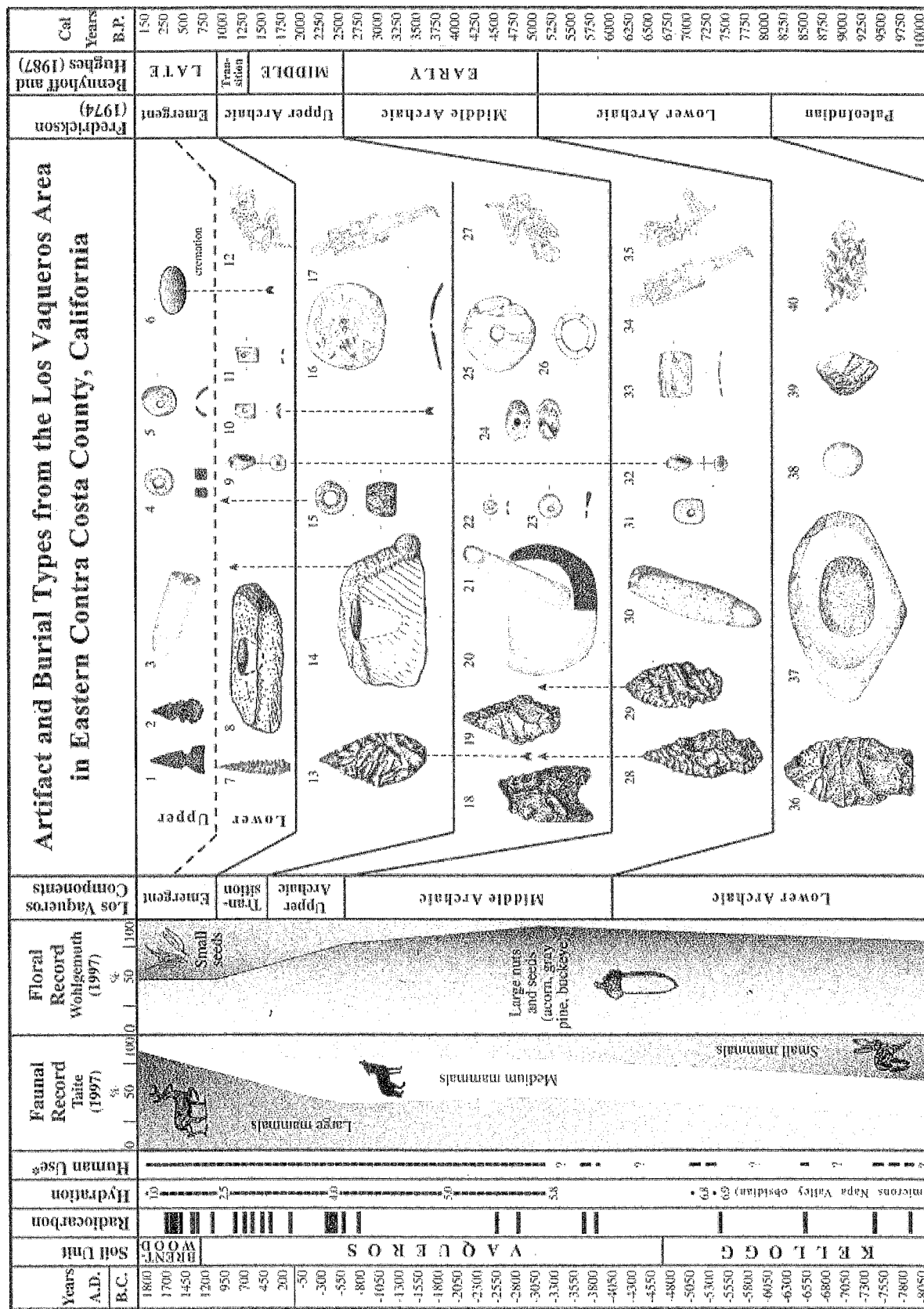
YEARS B.C./A.D.	GEOLOGIC TIME	CULTURE	PERIOD	ASSEMBLAGE
A.D. 1769	LATE HOLOCENE	ESSELEN SALINAN CHUMASH COSTANOAN	HISTORIC	
			LATE	 COTTONWOOD  DESERT SIDE-NOTCHED  DRILLS  STEATITE BEADS  LIPPED OLIVELLA (CLASS E) BEADS  BEDROCK MORTARS HOPPER MORTAR
A.D. 1250			MIDDLE-LATE-TRANSITION	 CONTRACTING-STEMMED  SMALL LEAF-SHAPED  DOUBLE SIDE-NOTCHED  CIRCULAR SHELL FISHHOOK  OLIVELLA G2 SAUCER BEAD  OLIVELLA K CUPPED BEAD  OLIVELLA G1 SAUCER BEAD  NOTCHED STONE (SINKER)
A.D. 1000	MIDDLE HOLOCENE	HUNTING	MIDDLE	 CONTRACTING-STEMMED  BONE GORGE  GROOVED STONE NET WEIGHT
A.D. 1			EARLY	 CONTRACTING-STEMMED  ROSSI SQUARE-STEMMED  ANNO NUEVO LONG-STEMMED  LARGE SIDE-NOTCHED  BONE GORGE  OLIVELLA CLASS L BEADS  LARGE SIDE-NOTCHED JALAMA VARIANT  DRILLED STEATITE PEBBLE  BOWL MORTAR
600 B.C.				
3500 B.C.	EARLY HOLOCENE	MILLINGSTONE	MILLINGSTONE- EARLY ARCHAIC	 ECCENTRIC CRESCENT  LARGE SIDE-NOTCHED  LANCEOLATE  CORE HAMMER  CORE TOOL  MILLING SLAB  HAND STONE
8000 B.C.	TERMINAL PLEISTOCENE	PALEO- INDIAN		

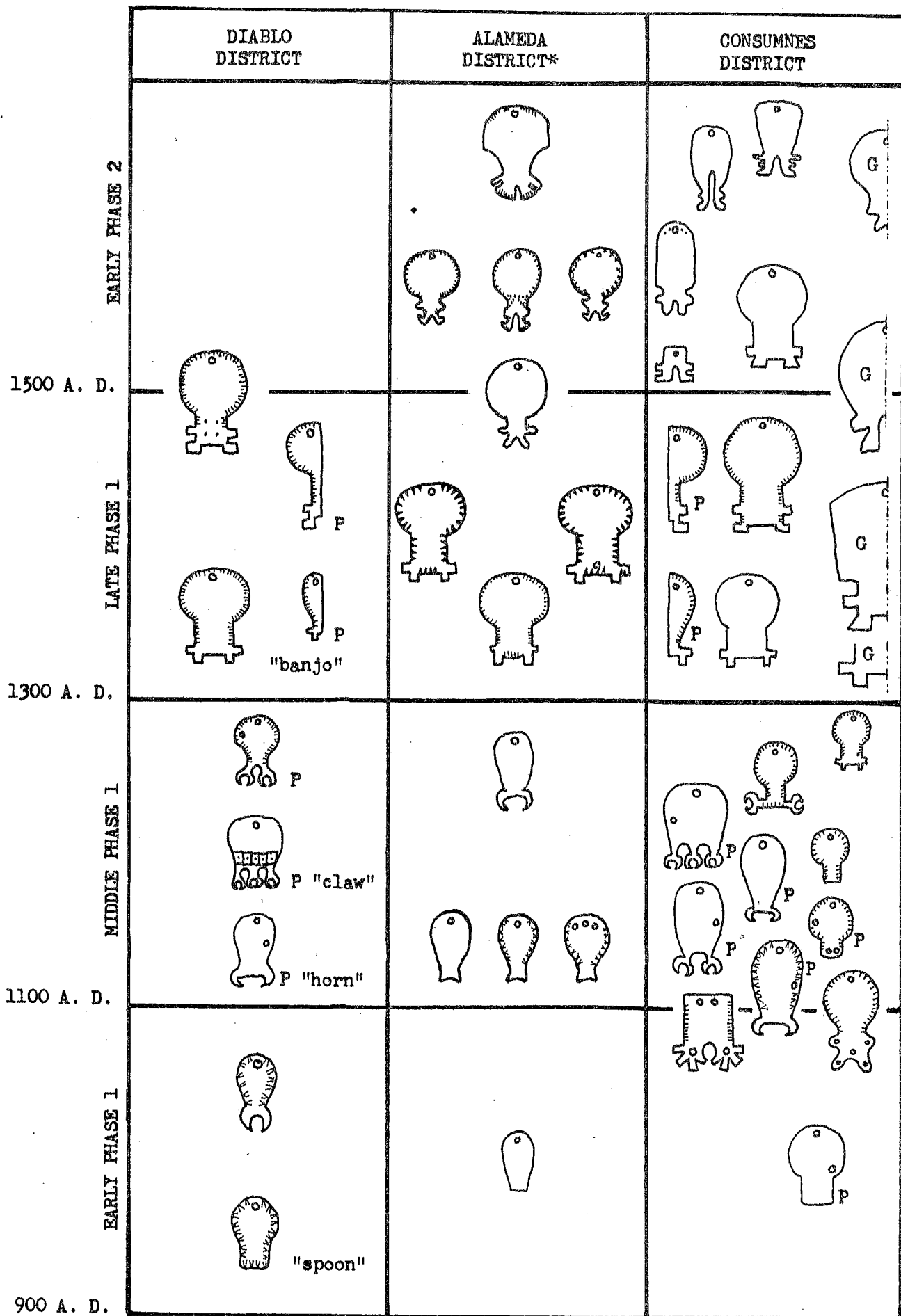
Figure 9.4. Generalized culture history for the Central Coast region.



Key: (1) Panoche side-notched and desert side-notched projectile points (mainly cryptocrystalline rock);
 (2) Stockton side-notched and corner-notched projectile points made only of obsidian;
 (3) small cylindrical pestles;
 (4) clamshell disk beads;
 (5) lipped *Olivella* beads, Type E;
 (6) cremation of human remains;
 (7) Stockton stemmed projectile points made only of obsidian;
 (8) small block mortars;
 (9) spire-lopped *Olivella* beads, Type A1b;
 (10) thin rectangular *Olivella* beads, Type M1;
 (11) thin rectangular *Olivella* beads, Type M2;
 (12) tightly flexed burials with variable orientations;
 (13) shouldered lanceolate projectile point made of obsidian;
 (14) bedrock mortars (Upper Archaic Period cups larger than Emergent Period cups;
 (15) steatite beads;
 (16) *Haliotis* ornaments, Type CA4fm;
 (17) ventrally extended burials primarily with northern orientations;
 (18) concave-base projectile points made of chert and obsidian;
 (19) contracting-stemmed projectile point made of chert;
 (20) shaped and cobble bowl mortars;
 (21) shaped and cobble pestles;
 (22) saucer *Olivella* beads, Type G1 and G2;
 (23) *Macoma* clam disk beads;
 (24) split *Olivella* beads, Type C;
 (25) *Haliotis* ornaments, Type C1C;
 (26) *Haliotis* ornaments, Type C2C;
 (27) tightly flexed burials, primarily with southwest orientation;
 (28) side-notched projectile point made of chert (CCO-637, Burial 7, 3850 cal B.C.);
 (29) side-notched projectile point made of chert (CCO-637, Burial 5, 3720 cal B.C.);
 (30) cobble pestles with convex parabolic end wear;
 (31) thick rectangular *Olivella* beads;
 (32) spire-lopped *Olivella* beads, Type A1a;
 (33) *Haliotis* ornament, Type uBA7;
 (34) fully extended and semiextended burials, primarily with northwest orientations;
 (35) loosely flexed burials, primarily with northwest orientations;
 (36) wide-stemmed projectile point made of obsidian (CCO-696, 6.9 microns Napa Valley);
 (37) millingslabs and oval bifacial handstones;
 (38) small round handstones;
 (39) cobble-core tools;
 (40) cairn burial (CCO-696, Burial 160, 5540 cal B.C.).

Approximate timing and duration of human use in the project area based on combined radiocarbon and obsidian hydration evidence. Courtesy of Jack Meyer.

FIGURE 31

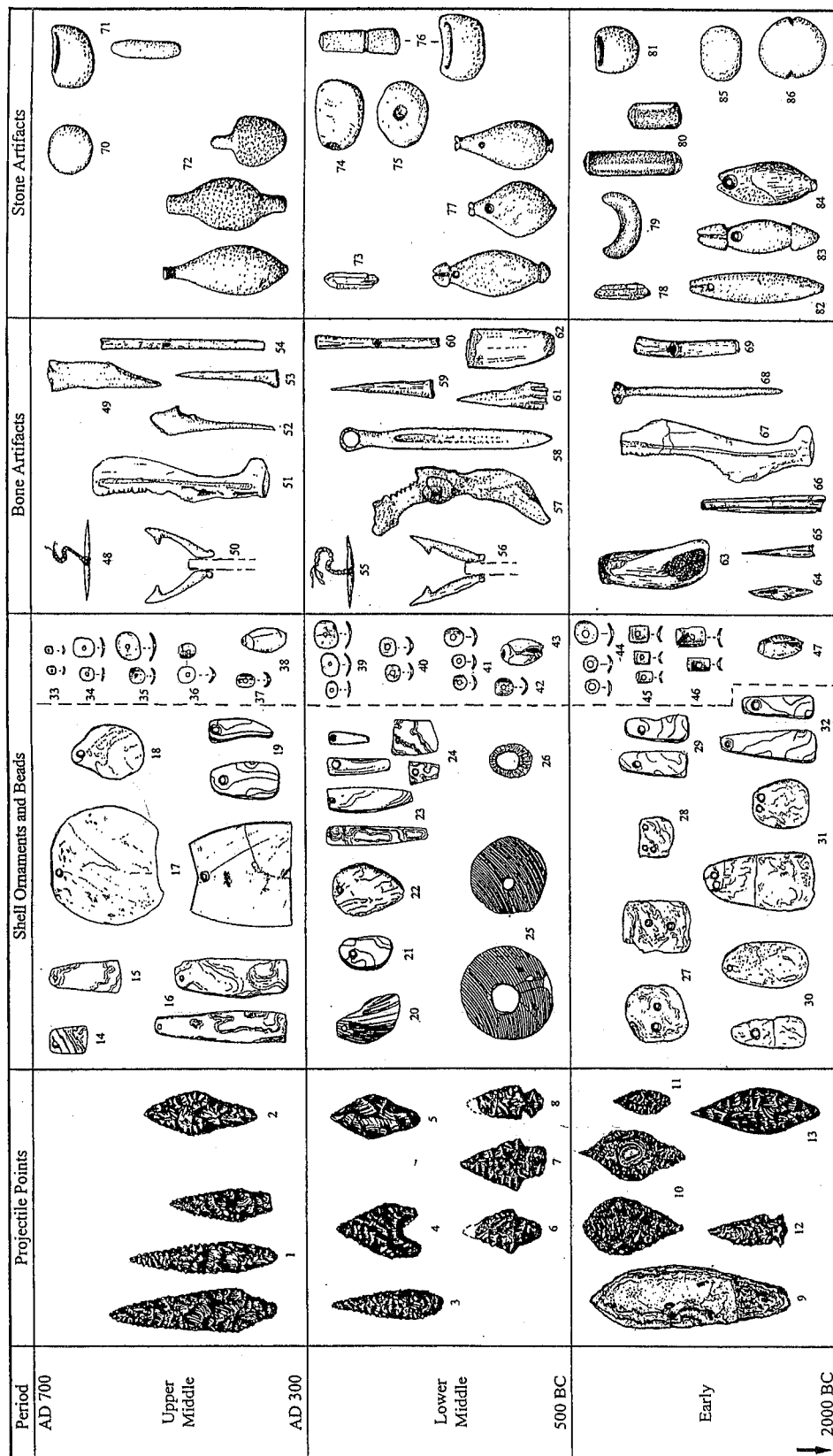


GENERALIZED SCHEMA SHOWING THE EVOLUTION OF HALIOTIS EFFIGY ORNAMENT FORMS WITHIN SELECTED CENTRAL CALIFORNIA ARCHAEOLOGICAL DISTRICTS.

No scale. Adapted from Bennyhoff 1971, 1973, 1975; Gifford 1947.

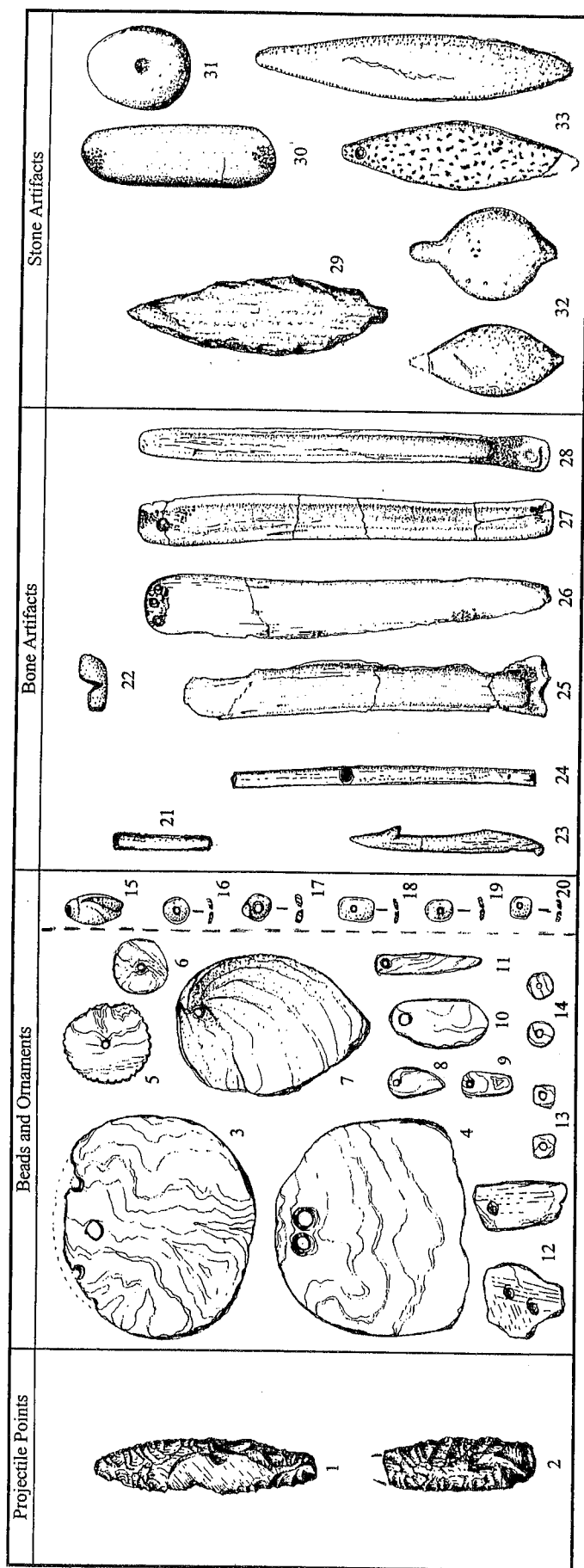
* Anthropomorphic forms presently known from S. Bay context only.

P = Often occur paired. G = Gorget made from whole shell.



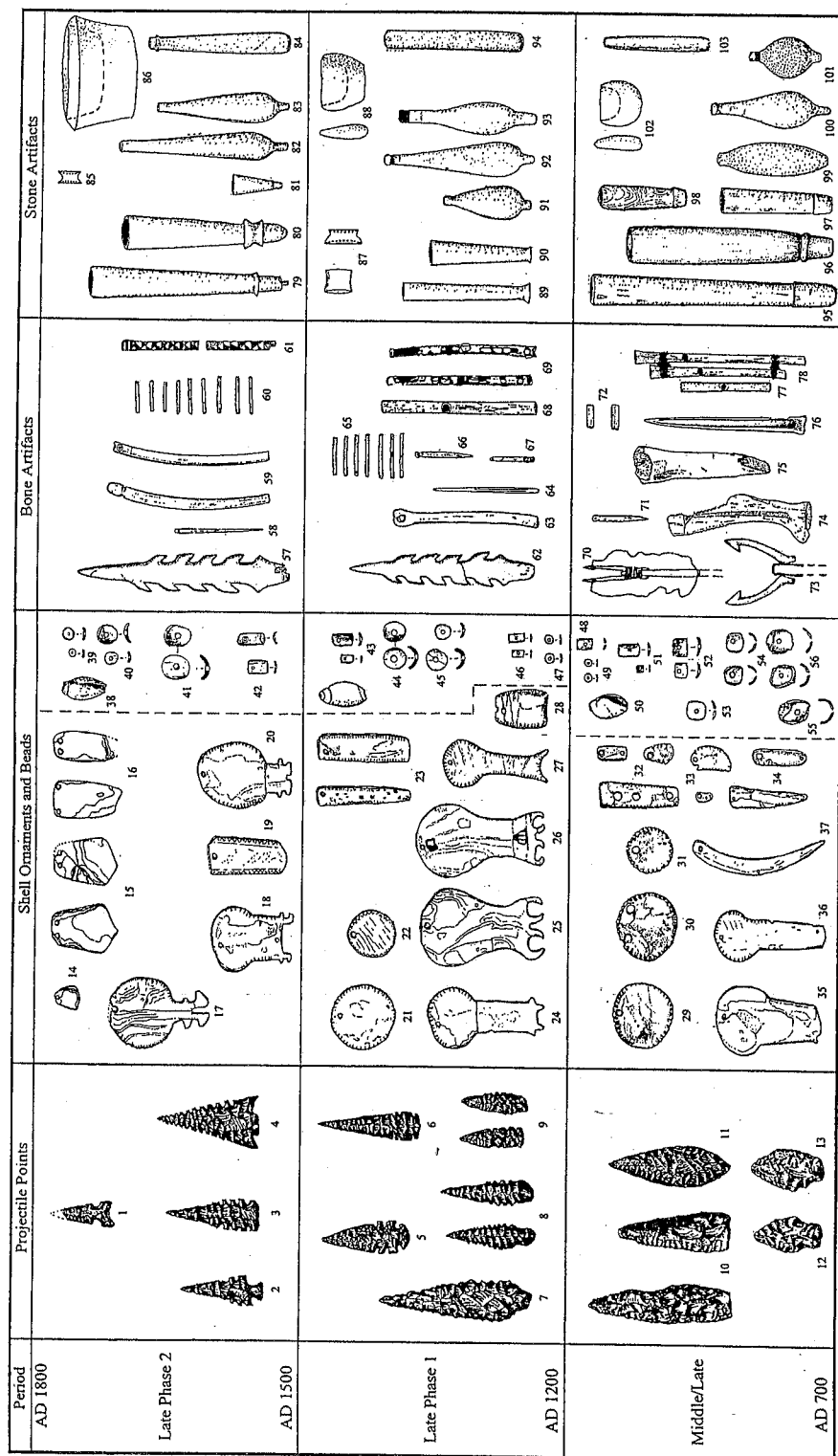
KEY (*Haliotis* effigy pendant nomenclature after Gifford [1947], other *Haliotis* and *Olivella* bead types after Bernyhoff and Hughes [1987]): 1- Obsid. lanceolate point, SCL-131; 2- Mont. chert long-stemmed point, SCL-178; 3- Obsid. lanceolate point, SCL-131; 4- Obsid. concave base point, ALA-328; 5- Mont. chert long-stemmed point, ALA-328; 6- Franc. chert contracting-stemmed point, SCL-137; 7- Franc. chert square-stemmed point, SCL-137; 8- Chalcedony side-notched point, SCL-12; 9- Mont. chert knife, SMA-77; 10- Mont. chert long-stemmed points (2), SMA-77; 11- Obsid. long-stemmed point, SMA-77; 12- Mont. chert side-notched point, SMA-77; 13- Mont. chert contracting-stemmed point, SCL-354; 14- *Haliotis* BA3 pendant, ALA-328; 15- *Haliotis* FB3 pendant, ALA-328; 16- *Haliotis* "shield" ornaments (2), ALA-328; 18- *Haliotis* AF4a (Gifford 1947) pendant, SCL-6; 19- *Haliotis* FB3 and EB3 pendants (2), ALA-328; 20- *Haliotis* AB1a pendant, SCL-732; 21- *Haliotis* A2aIII pendant, SCL-732; 22- *Haliotis* pendant, SCL-732; 23- *Haliotis* pendants (4), ALA-328; 24- *Haliotis* pendants (2), ALA-328; 25- *Haliotis* J2a1 pendants (2), SCL-732; 26- *Lotia giginea* ornament, SCL-732; 27-32 *Haliotis* pendants (11), SMA-77; 33- *Olivella* F3b2 beads, SCL-300; 34- *Olivella* F3a beads, SCL-755; 35- *Olivella* F2b beads, ALA-328; 36- *Olivella* C2 beads, SCL-755; 37- *Olivella* C3 bead, SCL-755; 38- *Olivella* A1 bead, SCL-732; 39- *Olivella* F2a beads, SCL-732; 40- *Olivella* F1 beads, SCL-732; 41- *Olivella* C2 beads, SCL-732; 42- *Olivella* C3 beads, ALA-328; 43- *Olivella* A1 bead, SCL-732; 44- *Olivella* C3 beads, SCL-354; 45- *Olivella* L2 beads, SMA-77; 46- *Olivella* L1 beads, SMA-77; 47- *Olivella* A1 bead, SMA-77; 48- Bone fishing gorge, ALA-328; 49- Antler wedge, ALA-328; 50- Bone fish spear, ALA-328; 51- Serrated scapula saw, ALA-328; 52-53 Bone awls, ALA-328; 54 Bird bone whistle, SCL-300; 55- Bone fishing gorge, ALA-328; 56- Bone fish spear, ALA-328; 57- Serrated bone innotinate saw, ALA-328; 58- Elk bone spatula, ALA-328; 59- Bone awl, ALA-328; 60- Bird bone whistle, SCL-732; 61- Bone awl, ALA-328; 62- Antler wedge, SCL-732; 63- Antler wedge, SMA-77; 64-66 Bone awls, SMA-77; 67- Serrated scapula saw, SMA-77; 68- Fibula pendant (*Ursus horribilis*), SCL-354; 69- Mammal bone whistle (type FF1a after Gifford 1940:181), SMA-77; 70- Handstone, SCL-300; 71- Mortar/pestle, SCL-300; 72- Charnstone group (3), ALA-328; 73- Quartz crystal, SCL-131; 74-75 Handstones, SCL-732; 76- Mortar/pestle, ALA-328; 77- Charnstone group (3), ALA-328; 78- Quartz crystal, SMA-77; 79- Crescentic stone, SMA-77; 80- Pestles (2), SMA-77; 81- Mortar, SMA-77; 82- Perforate charnstone, SMA-77; 83- Perforate phallic charnstone, SCL-354; 84- Perforate charnstone, SMA-77; 85- Handstone, SCL-354; 86- Notched stone, SMA-77.

Figure 13.6 Early Bay and Berkeley pattern artifact assemblages. Chart illustrated by Mark Hylkema and Glen Wilson 1998 (Artifacts not drawn to scale).



Key: (*Haliotis* pendants and *Olivella* bead types after Bennyhoff and Hughes 1987): 1- Obsid. lanceolate; 2- Obsid. lanceolate; 3- *Haliotis* CA5j "shield" pendant; 4- *Haliotis* FF5a "shield" pendant; 5- *Haliotis* CA2f pendant; 6- *Haliotis* RB4bf pendant; 7- *Haliotis* E2F3b gorget; 8- *Haliotis* EA3j pendant; 9- *Haliotis* E2A3j pendant; 10- *Haliotis* SC3j pendant; 11- *Haliotis* E2B3j pendant; 12- Mica pendants; 13- *Haliotis* square beads (H4 type after Gifford 1947); 14- *Haliotis* CA2j bead; 15- *Olivella* G2a bead; 16- *Olivella* A1 bead; 17- *Olivella* G5 bead; 18- *Olivella* M/F3 bead; 19- *Olivella* F3b2 bead; 20- *Olivella* F3b bead; 21- Bird bone tube; 22- Atlart spur; 23- Fish spear; 24- Bird bone whistle; 25-28 Elk bone spatulates; 29- Phyllite lanceolate; 30- Pestle; 31- Bi-pitted stone; 32-33 Charmstones (4).

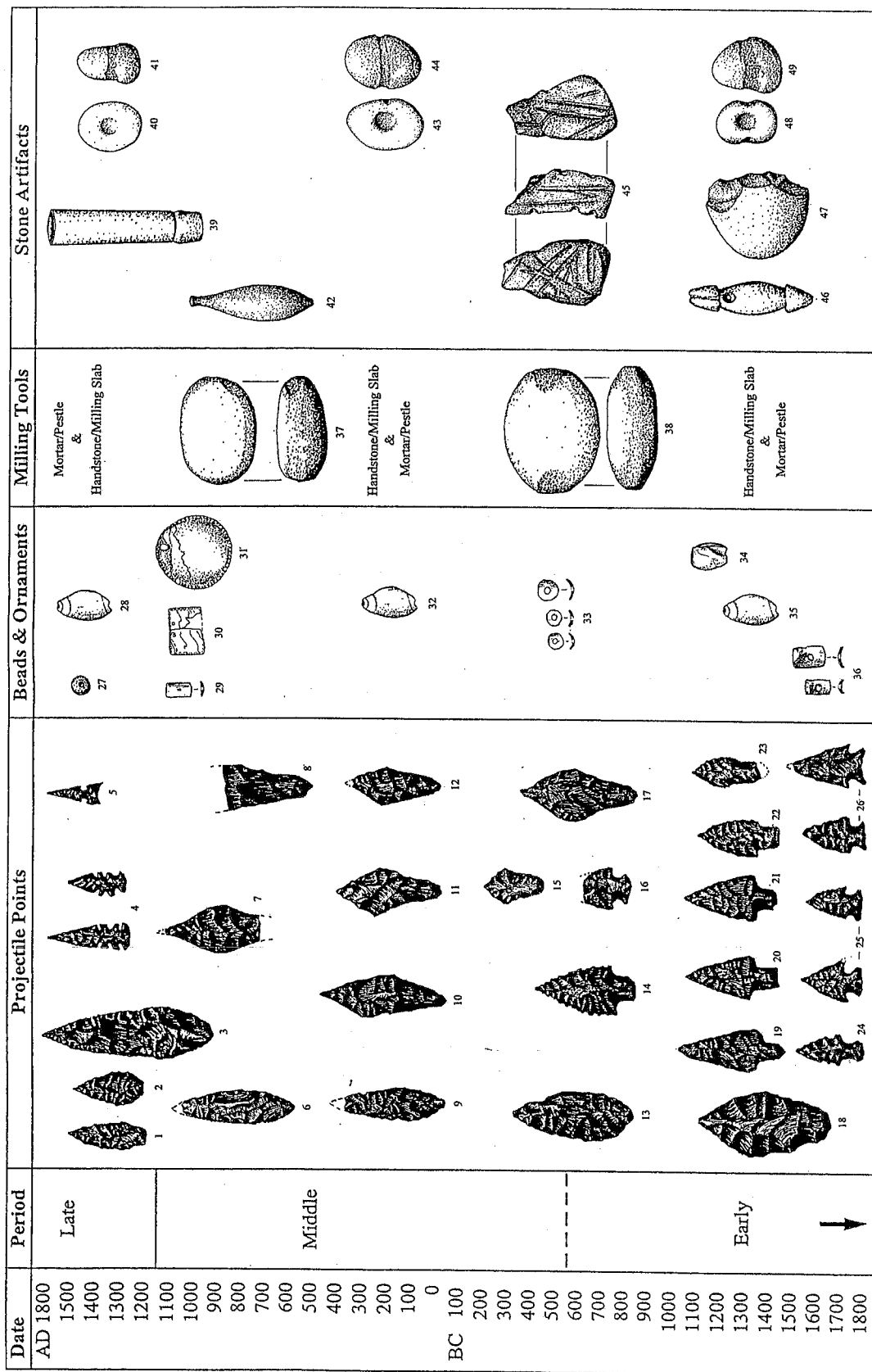
Figure 13.7 Meganos tradition artifact assemblage from ALA-343. Chart by Mark Hylkema 1998 (Artifacts not drawn to scale).



KEY (*Haliotis* effigy pendant nomenclature after Gifford [1947], other *Haliotis* and *Olivella* bead types after Bennyhoff and Hughes [1987]):

1- Franc. chert Desert side-notched point, SCL-178; 2- Obsid. Expanding-stemmed serrate, ALA-329; 3- Obsid. serrate, ALA-329; 4- Obsid. serrated triangulate point, ALA-329; 5- Obsid. Stockton serrate, SCL-690; 6- Obsid. Stockton serrate, SCL-38; 7- Obsid. serrated lanceolate, SCL-38; 8- Obsid. stemmed serrate (2), ALA-329; 9- Obsid. serrate (2), SCL-690; 10- Obsid. slightly serrated lanceolate (2), SCL-690; 11- Obsid. lanceolate, SCL-6; 12- Franc. chert side-notched point, SCL-690; 13- Mont. chert contracting-stemmed point, SCL-690; 14-16 *Haliotis* pendants, SCL-30/H Mission Santa Clara; 17- *Haliotis* N1bIII effigy pendant, ALA-329; 18- *Haliotis* N6bIII effigy pendant, SCL-38; 19- Incised *Haliotis* pendant, SCL-128; 20- *Haliotis* N1bIII effigy pendant (2), ALA-329; 21- *Haliotis* CA3a pendant, SCL-690; 22- Incised *Haliotis* pendant, SCL-690; 29- *Haliotis* CA3g pendant, SCL-690; 30- *Haliotis* CA5g pendant, SCL-690; 31- *Haliotis* CA3h pendant, SCL-690; 32- *Haliotis* BB106, BB8 and FA3h pendants, SCL-690; 33- *Haliotis* OJ3 and TA3h pendants, SCL-690; 34- *Haliotis* EB3a and BB8a pendants, SCL-690; 35- *Haliotis* N1aII effigy pendant, SCL-690; 36- *Haliotis* N4 effigy pendant, SCL-690; 37- *Haliotis* crescent (type AP after Gifford 1947), SCL-38; 38- *Olivella* A1 bead (all sites); 39- *Olivella* H1a beads and BB8a pendants, SCL-690; 40- *Olivella* E2 beads, ALA-329; 41- *Olivella* E3b beads, ALA-329; 42- *Olivella* M3 beads, SCL-38; 43- *Olivella* M2 beads, SCL-38; 44- *Olivella* E2a beads, ALA-329; 45- *Olivella* E3 beads, ALA-329; 46- *Olivella* M1c beads, SCL-38; 47- *Olivella* G1 beads, ALA-329; 48- *Olivella* M/F3 beads, SCL-690; 49- *Olivella* G1 beads, SCL-690; 50- *Olivella* A1 beads, (all sites); 51- *Olivella* M1a beads, SCL-690; 52- *Olivella* M1d beads, ALA-329; 53- *Olivella* F3a bead, SCL-755; 54- *Olivella* C7 beads, SCL-690; 55- *Olivella* D1 beads, SCL-690; 56- *Olivella* C6 beads, SCL-690; 57- Serrated antler harpoon, ALA-329; 58- Batray spine, ALA-329; 59- Elk rib strigils, SCL-38; 60- Bird bone beads, SCL-38; 61- Incised bird bone whistle, SCL-38; 62- Serrated antler harpoon, SCL-38; 63- Perforate bone, ALA-329; 64- Batray spine, SCL-38; 65- Bird bone beads, ALA-329; 66- Bone needle, SCL-329; 67- Bone point with asphaltum, SCL-38; 68- Whistle, SCL-38; 69- Whistles with *Olivella* M1a bead applique, SCL-38; 70- Bone tipped fish spear with asphaltum, SCL-690; 71- Bone needle, SCL-38; 72- Bone tubes, SCL-690; 73- Bone fish spear, SCL-1; 74- Serrated scapula saw, SCL-690; 75- Antler wedge, SCL-690; 76- Bone pin, SCL-690; 77- Whistle, SCL-690; 78- Whistles adhered together with asphaltum, SCL-690; 79-81 Tobacco pipes, ALA-329; 82-83 Charmstones, ALA-329; 84- Flanged pestle, ALA-329; 85- Ear spool, ALA-329; 86- "Flower pot" mortar, ALA-329; 87- Ear spools (2), ALA-329; 88- Mortar and pestle, SCL-38; 89-90 Tobacco pipes, ALA-329; 91-93 Charmstones, SCL-38; 94- Long pestle, SCL-38; 95- Tobacco pipe, ALA-329; 96- Tobacco pipe, SCL-690; 97-98 Tobacco pipes SCL-38; 99-100 Charmstones, SCL-690; 101- Charmstone, SCL-38; 102- Mortar and pestle, SCL-690; 103- Long pestle, SCL-690.

Figure 13.8 Southern San Francisco Bay area Augustine pattern artifact assemblages. Chart illustrated by Mark Hylkema and Glen Wilson 1998 (Artifacts not drawn to scale).



KEY: 1- Obsid. lanceolate, SMA-97; 2- Obsid. lanceolate, SMA-134; 3- Large obsid. lanceolate, SMA-97; 4- Obsid. Stockton serrates, SMA-244; 5- Mont. chert DSN, SCR-20; 6- Obsid. lanceolate, SMA-97; 7- Mont. chert Ano Nuevo long-stemmed, SMA-97; 8- Mont. chert Ano Nuevo long-stemmed base, SCR-132; 9- Obsid. lanceolate, SCR-9; 10, 11 & 12- Mont. chert Ano Nuevo long-stemmed, SCR-9; 13- Mont. chert lanceolate, SCR-38/40; 14- Franc. chert Rossi square-stemmed, SCR-9; 15- Obsid. Ano Nuevo long-stemmed, SCR-9; 16- Mont. chert corner-notched, SCR-9; 17- Mont. chert Ano Nuevo long-stemmed, SMA-218; 18- Mont. chert Ano Nuevo long-stemmed, SCR-38/40; 19- Mont. chert shouldered contracting-stemmed, SCR-38; 20- Mont. chert Rossi square-stemmed, SCR-7; 21- Franc. chert corner-notched, SCR-7; 22- Mont. chert Rossi square-stemmed, SCR-38; 23- Obsid. Ano Nuevo long-stemmed, SCR-20; 24- Mont. chert serrated expanding-stemmed, SCR-9; 25 & 26- Franc. chert corner-notched, SCR-7; 27- Talc-schistose disc bead, SMA-244; 28- Olivella A1 bead, SMA-244; 29- Olivella M1 bead, SCR-20; 30- Incised *Haliotis* circular pendant, SMA-238; 31- Incised *Haliotis* circular pendant, SMA-22; 32- Olivella A1 bead, SCR-9; 33- Olivella G3 and G6 beads, SMA-22, SCR-9 & SMA-218; 34- Olivella B2 bead, SCR-38; 35- Olivella A1 bead, SCR-38; 36- Olivella L1 beads, SCR-9; 37- Handstone, SCR-132; 38- Handstone, SCR-9; 39- Smoking pipe, SCR-117; 40- Bi-pitted cobble, SMA-134; 41- Grooved sinker, SMA-115; 42- Piled charmonite, SCR-132; 43- Bi-pitted cobble, SCR-132; 44- Grooved sinker, SCR-132; 45- Incised sandstone cobble, SCR-9; 46- Perforate charmonite, SCR-9; 47- Cobble chopper, SCR-9; 48- Bi-pitted cobble, SCR-7; 49- Grooved sinker, SCR-38.

Figure 13.9 Artifacts characteristic of Late Holocene coastal sites of San Mateo and Santa Cruz Counties. Chart by Mark Hylkema 1998 (Artifacts not drawn to scale).

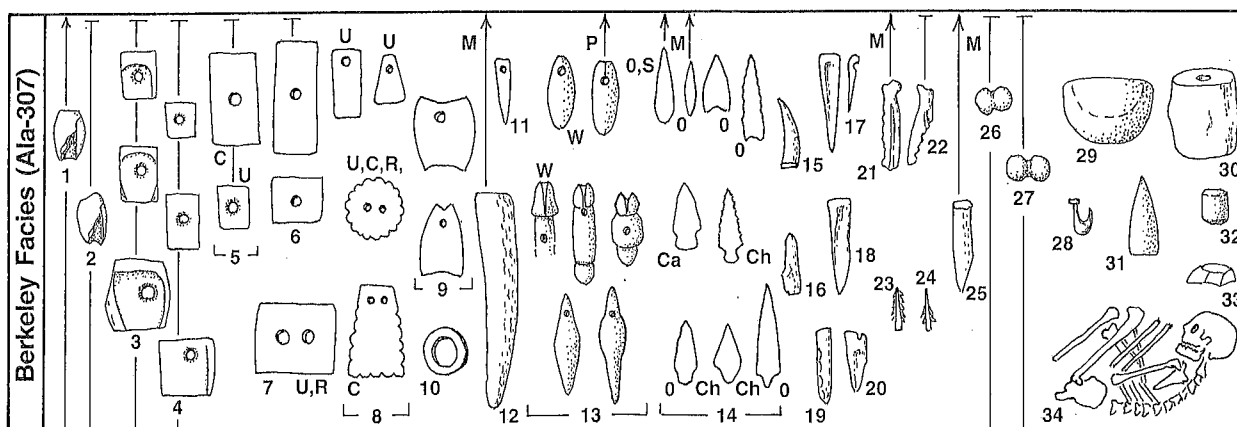


Chart by J. A. Bennyhoff, 1972.

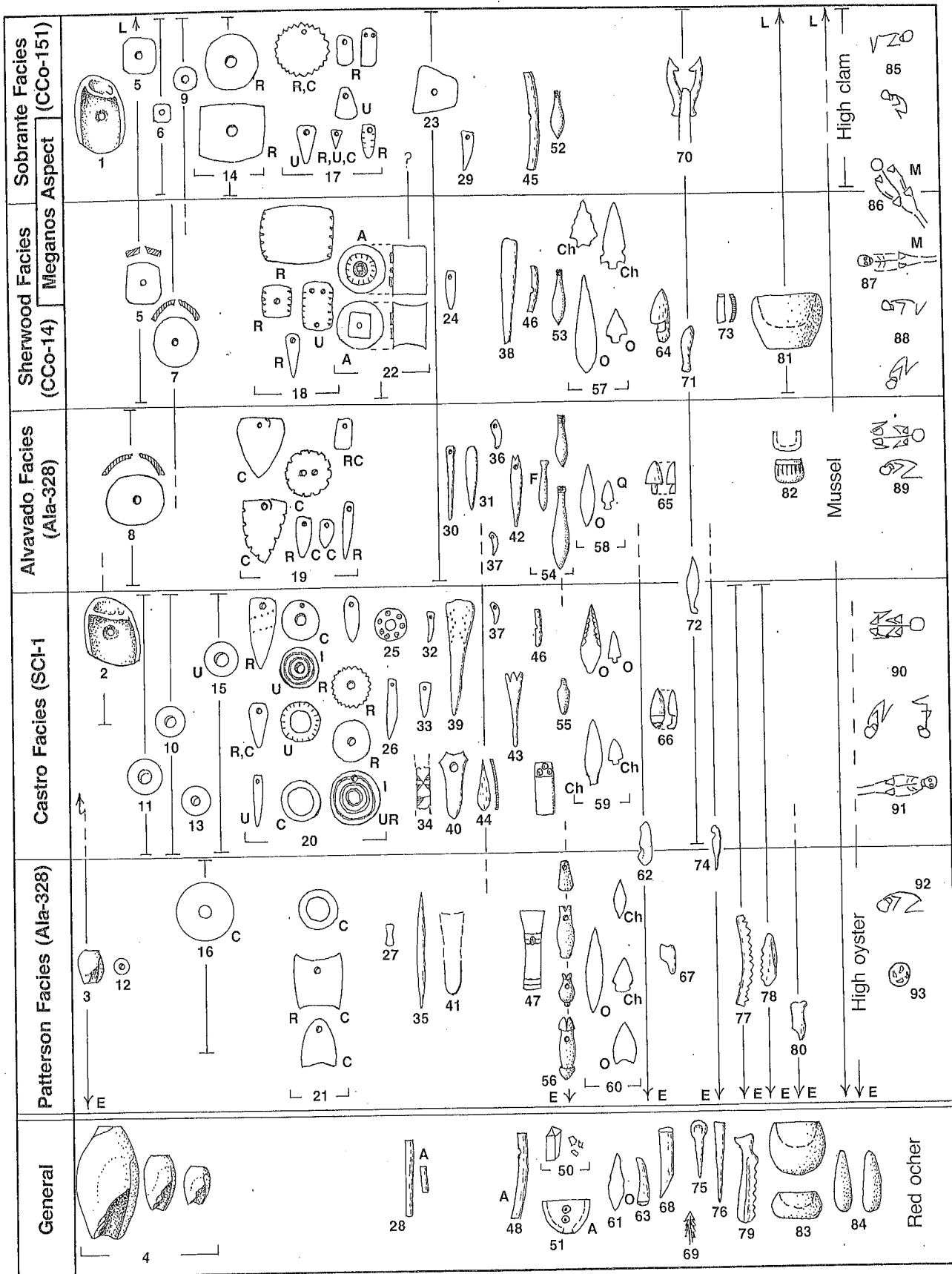
Fig. 2. Early Horizon, Berkeley Facies, Alameda District: Significant artifact types. Shell beads approximately actual size; relative scale attempted for remainder within related groups but not among different classes of artifacts. Position on chart of specimens within facies has no chronological significance. Bead typology from Lillard, Heizer, and Fenenga 1939. C, *Haliotis cracherodii*; Ca, chalcedony; Ch, chert; M, trait carries over into Middle Horizon; O, obsidian; P, trait survives into Patterson facies (Early-Middle Horizon Transition); R, *Haliotis rufescens*; S, slate; U, haliotis, unidentified sp.; W, cf. charmstone types of blue schist from Early Horizon, Interior, Types B2, E2.

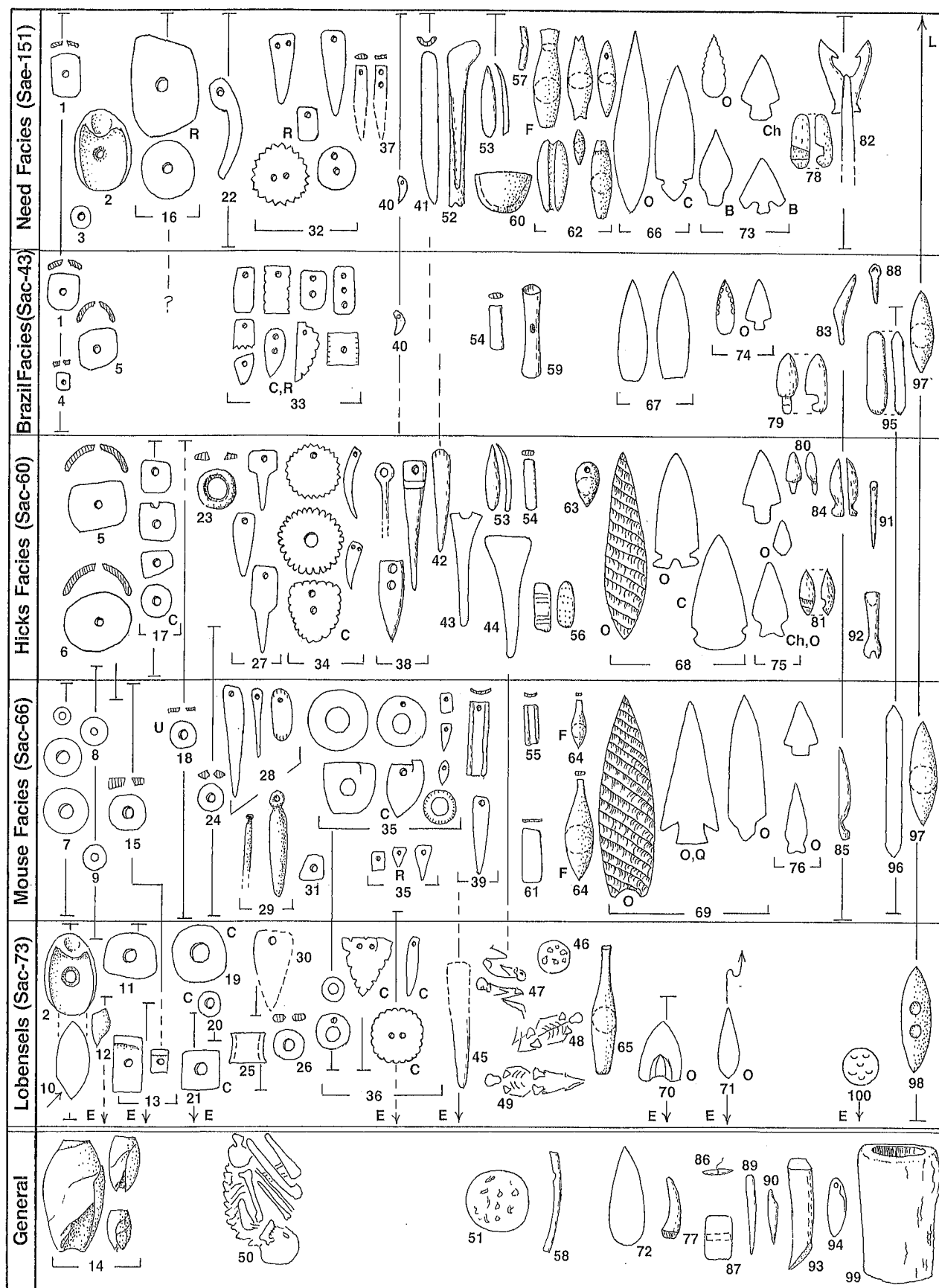
1-4, olivella beads: 1. Small, spire-lopped, Type 1a; 2. Small, diagonal ground, Type 1c; 3. Thick rectangle, shelved, Type 2b; 4. Thick rectangle, simple, Type 2b. 5. *Mytilus* rectangular, square beads. 6-8, haliotis beads and ornaments: 6. Rectangular, square, Type 1a; 7. Rectangular, with double perforation, also incised, Type 2; 8. ornament. 9. Steatite pendants (may represent Patterson facies, Early-Middle Horizon Transition). 10. Steatite ring. 11. Mammal-bone pendant. 12. Antler spatula. 13. Perforated charmstones. 14. Chipped-stone projectile points and/or knives. 15. Antler-tine flaker. 16. Mammal-bone (ulna) flaker. 17. Mammal-bone awls. 18. Mammal cannon bone gouge. 19. Chipped mammal-bone tool. 20. Mammal-bone fiber stripper (?). 21. Serrated mammal scapula (Bay region form). 22. Serrated mammal scapula (Napa region form). 23. Unmodified sting ray spine. 24. Ground sting ray spine. 25. Antler wedge. 26. Notched stone net sinker. 27. Grooved stone net sinker. 28. Bone curved fishhook. 29. Stone mortar. 30. Whale vertebra container (?). 31. Stone pestle, conically shaped. 32. Stone pestle, "stubby." 33. Chert scraper-plane. 34. Flexed burial with no set orientation characteristic.

Chart by J. A. Bennyhoff, 1972.

Fig. 3. Middle Horizon, Alameda District: Significant artifact types and temporal changes, from Patterson (Early-Middle Horizon Transition) facies to Sobrante facies (Late Middle Horizon), taken from representative sites. Olivella beads shown approximately actual size; relative scale attempted for remainder within related groups but not among different classes. Position of specimens shown within facies has no chronological significance. Bead typology from Lillard, Heizer, and Fenenga 1939. A, appliqué in asphalt decoration; C, *Haliotis cracherodii*; Ch, chert; E, trait persists from Early Horizon; F, "fishtail" charmstone; I, double-line facial incision; L, trait persists into Late Horizon; MA, Meganos Aspect (hybrid expression of Early and Middle Horizon cultures) trait; O, obsidian; Q, quartzite; R, *Haliotis rufescens*; U, haliotis unidentified. References to oyster, mussel, and clam indicate frequency of these mollusks in midden deposits through time.

1-12, olivella beads: 1,2. Split-drilled, Type 3b1; 3. Small spire-lopped, Type 1a; 4. Spire-lopped, Types 1a, 1b; 5. Modified "saddle," Type 3b2; 6. Small "saddle," Type 3b2; 7. Round "saddle," Type 3b; 8. Full "saddle," Type 3b; 9,10. "saucer," Type 3c; 11. Ring, Type 3c; 12. Tiny disk, Type 3d. 13. *Mytilus* disk bead. 14-16, haliotis beads: 14. Large amorphous beads, Type H4b; 15. Nacreous disk, Type H3a; 16. Large disk, Type H3b2. 17-21, haliotis ornaments. 22. Earspool with haliotis appliqué at one end. 23. Mica ornament. 24. Slate pendant. 25. Slate ring with olivella appliqué. 26. Slate pendant. 27. Steatite "constricted" beads. 28. Bone tubes, beads (often with olivella appliqué). 29. Antler pendant. 30. Perforated bone hairpin. 31. Flat bone pin. 32,33. Bone pendants. 34. Incised bone (pendant). 35. Long bipointed pin. 36. Bear tooth pendant. 37. Canid tooth pendant. 38-41. Bone, antler spatulae. 42. Perforated head scratcher (bone). 43. Forked head scratcher (bone). 44. Split rib strigil. 45. Long bird-bone whistle, central stop. 46. Short bird-bone whistle, central stop. 47. Human (?) tibia whistle. 48. Bird-bone whistle, end stop. 49. Slate bar with olivella appliqué. 50. Whole, fractured, quartz crystals. 51. Steatite or marble "cloud blower" (?), often with olivella appliqué. 52-56. Charmstones (52-54 with asphalted ends). 57-60. Chipped stone spear, dart points. 61. Obsidian knife. 62. Bone (ulna) flaker. 63. Antler tine flaker. 64-67. Bone atlatl spurs. 68. Antler wedge. 69. Sting ray spine. 70. Barbed bone fish spears. 71,72. Unbarbed bone fish spears (?). 73. Ground beaver incisor. 74. Bone (ulna) awl. 75. Cannonbone awl or punch. 76. Ground bone awl. 77. Serrated rib. 78. Serrated fish bone. 79. Serrated mammal scapula. 80. Bone fiber-stripper. 81. Shaped stone mortar. 82. Incised (decorated) stone mortar. 83. Boulder mortar. 84. Cobble pestle. 85-93, Mortuary complex (available data not precise—emphasis is on variable flexed and semiflexed positions, with presumed local or no fixed orientation): 85. Flexed, with orientation to NW and NE quadrants; 86. Ventral extension, a marker for Meganos Aspect, significant at site CCo-151, orientation to SW, NW, and NE quadrants; 87. Dorsal extension, of rare and scattered occurrence; 88. Orientation to SW and NW quadrants; 89. Orientation to all points except NE quadrant; 90. Orientation to all quadrants, varying site to site within facies; 91. Dorsal extension, rare; 92. Orientation to NW quadrant; 93. Cremation, confined to Patterson (Early-Middle Horizon Transition) facies.





Early sites are by no means one-to-one. There are several traits, such as burial postures (flexed in Bay region, ventrally extended in lower Sacramento Valley) and a comparative abundance of stone mortars and pestles as well as bone artifacts in the Bay sites, that tend to set the two districts apart.

The earliest carbon-14 date of Early Bay culture (M-125) is from site Ala-307 (Berkeley facies)—about 1900 B.C. The oldest date (L-187B) from University Village site (SMA-77), probably in part contemporaneous or included in the Berkeley facies, is about 1200 B.C. Three additional finds from the coastal region, all predating 2000 B.C. (carbon-14 samples W-185, UCLA-259, UCLA-1425 A, B) may be indicators of man's early presence in the Bay region, but none of them can be connected precisely with any of the early facies here discussed. Thus, the Windmillier facies (Delta) sites are, on present evidence, older than those of the Berkeley facies. The times of earliest occupation in Interior and Coast regions are uncertain, but it is here suggested that the Early Horizon as a whole (Coast and Interior) terminated at around 1000 B.C.

While considerable developmental change is recognized in deposits assigned to the Early and Middle Horizon sites, there has not been unanimity of opinion on the causes of these changes. One explanation rests on linguistic categories. The Great Central Valley was occupied almost totally by groups identified as speakers of Penutian languages. The Hokan speakers are spread, with some intervals, around the periphery of the valley, and this distributional peculiarity has given rise to the supposition that the Hokans were early occupants of the region, later to be displaced by migrating Penutians coming from some area (Great Basin?) outside of California in response to marked climatic change.

Whatever the case, the Transition facies (Patterson and Lobensels facies, figs. 3 and 4) falling between Early and Middle Horizons imply a steady development, unmarred by sudden increments of foreign peoples. Thus it seems possible that Penutians may have entered the Central Valley in a gradual way, in a number of comparatively minor "waves," slowly replacing the original (Hokan?) peoples.

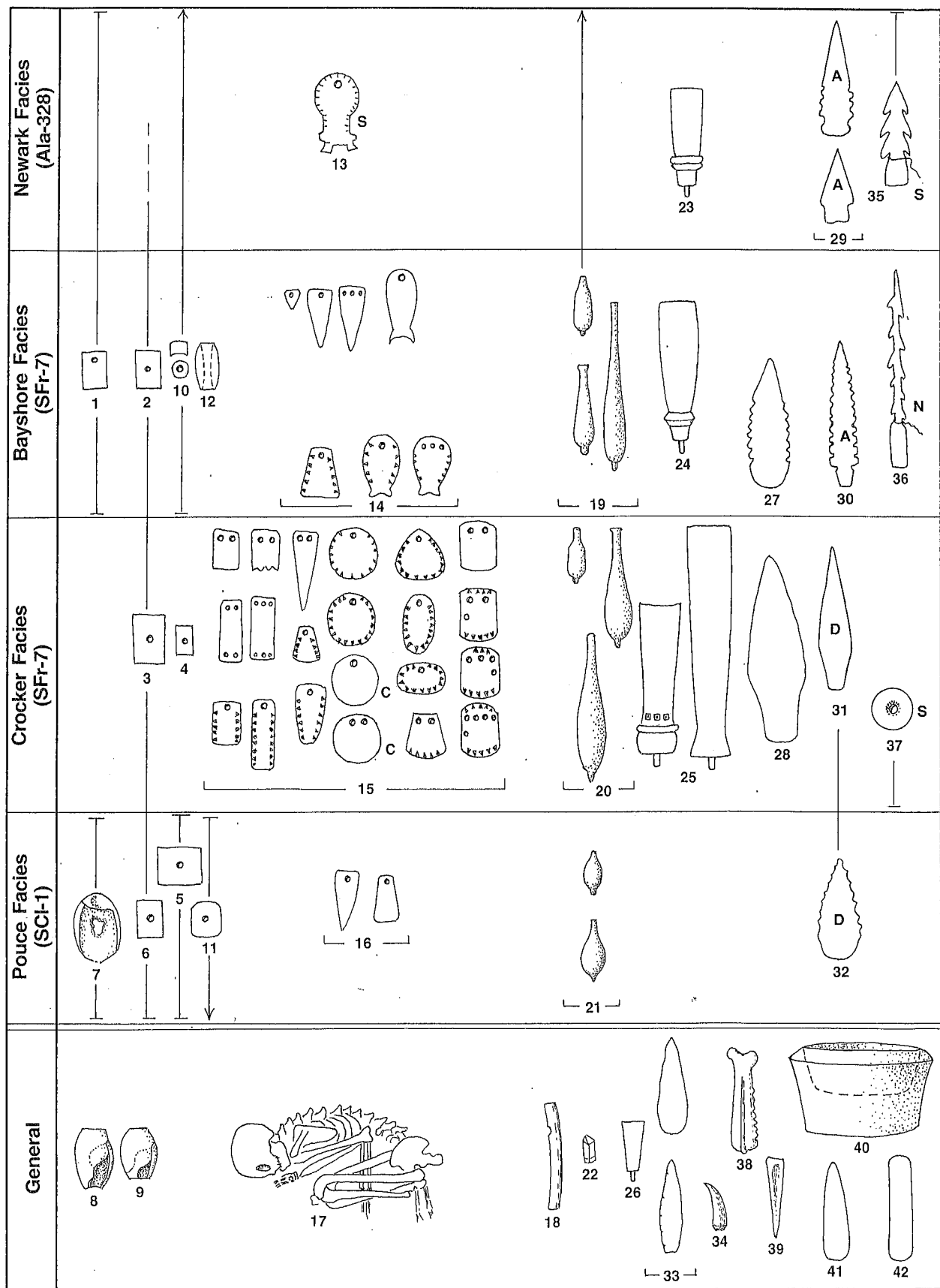
The rationale for distinguishing between Middle and Late Horizon facies, apart from the differing contents of site components, may ultimately rest on the proposal that by the time of the transition (about A.D. 300-500) the Penutian settlement in Central California was virtually complete. Observations that the Middle Horizon peoples left behind an abundance of bone objects, while those of the Late Horizon seemed to elaborate shell artifacts such as beads and ornaments, certainly do not lead to the impression of great peaks of technological achievement at any time during a span of about 2,500 years.

Nevertheless, figures 2-6 do show evidence of steady, detailed changes in several classes of artifacts. Variations in form or design of objects in all categories—stone, bone, and shell—are sufficient to confirm deep roots for the pattern of California ethnography enunciated by Kroeber (1925) and here paraphrased: general sameness, but with many minute regional differences.

In summarizing the identifying features of the Middle Horizon, primary dependence has been placed on Beardsley (1954), but figures 3 and 4 place the various traits in a more precise framework than Beardsley was able to offer. It is obvious that the major diagnostic and most sensitive indicators of change through time in the various facies of both Middle and Late Horizons are shell beads and ornaments, which are almost as useful to

Chart by J. A. Bennyhoff, 1972.

Fig. 4. Middle Horizon, Cosumnes District: Significant artifact types and temporal changes, from Lobensels (Early-Middle Horizon Transition) facies to Need (Late-Middle Horizon) facies. Olivella beads shown approximately actual size; relative scale attempted for remainder within related groups but not among different classes. Position of specimens shown within facies has no chronological significance. Bead typology from Lillard, Heizer, and Fenenga 1939. B, basalt; C, *Haliotis cracherodii*; Ch, chert; E, trait persists from Early Horizon; F, "fishtail" charmstone; L, trait persists into Late Horizon; R, *Haliotis rufescens*; U, *Haliotis* unidentified. 1-14, Olivella beads: 1. Modified "saddle," Type 3b2; 2. Split-drilled, Type 3b1. 3. Small "saucer," Type 3c; 4. Small modified "saddle," Type 3b2; 5. Full "saddle," Type 3b; 6. Round "saddle," Type 3b; 7. Ring, Type 3c2; 8. Large "saucer," Type 3c; 9. Small "saucer," Type 3c; 10. "Bevelled" bead (arrow points to bevel), Type 3b1; 11. Oval "saddle," Type 3b; 12. Diagonal spire-lopped, Type 1c; 13. Thick shelved rectangle, Type 2b; 14. Spire-lopped, Types 1a, 1b. 15. *Macoma* disk bead. 16-21, *Haliotis* beads: 16. Large, amorphous, Type H4; 17. Small, amorphous, Type H4; 18. Nacreous disk, Type H3; 19. Large disk, Type H3; 20. Small disk, Type H3; 21. Square, Type H1a. 22. Steatite "claw" pendant. 23. Steatite ring. 24. Steatite lenticular disk bead. 25. Steatite "hourglass" earspool. 26. Steatite flat disk bead. 27, 28. Flat slate pendants. 29. Cylindrical slate pendants. 30. Flat slate pendant. 31. Biotite ornament. 32-36. *Haliotis* pendants. 37-39. Bone pendants. 40. Canid tooth pendants. 41-45. Deer tibia and antler spatulae. 46. Cremation. 47. Flexed burial, all orientations. 48. Burial, ventral, semiextended, all orientations. 49. Burial, ventral, extended, all orientations. 50. Burial, tight flexure (most distinctive of Middle Horizon, though other positions, including rare extension, also occur). 51. Cremation (rare, none for Brazil facies). 52. Mammal tibia "wand." 53. Split rib strigil (Type 1). 54. Whole rib strigil (Type 2). 55. Flat bone strigil (Type 3). 56. Bone dice. 57. Bird-bone whistle, central stop. 58. Bird-bone whistle, end stop. 59. Mammal-bone whistle, central stop. 60. Steatite perforated cup ("cloud blower"?). 61. Flat stone bars. 62-65. Charmstones. 66-76. Chipped-stone artifacts: 66-69. Probably spear points (note careful diagonal flaking, on 68, 69, to left); 70. Knife designed for hafting; 71. Bipointed knife (occurs in all facies but most common in Lobensels); 72. Leaf-shaped knife; 73-76. Dart points. 77. Antler-tine flaker. 78-81. Atlatl spurs (?) of bone. 82. Barbed bone fish spear. 83-85. Unbarbed bone fish spears (?). 86. Bone gorge hook. 87. Bone mesh gauge. 88. Cannon bone awl, pointed distally. 89. Ground bone awl. 90. Bone splinter awl. 91. Bone needle. 92. Socketed antler handle. 93. Antler wedge (rare). 94. *Margaritifera* spoon, perforated. 95, 96. Flat slab pestle for use with wooden mortar. 97. Cylindrical bipointed pestle for use with wooden mortars. 98. Pitted bipointed pestle. 99. Wooden mortar.



California archeology as are potsherds in other parts of North America for analyzing culture processes.

During the Late Horizon, Phase 1, population was probably greater; consequently, there was a larger number of sites than in Middle Horizon. Interior earth middens show a similar wide distribution, as before, but the soil is darker and not so compacted as in the average Middle Horizon site. Late Horizon components succeeded those of Middle at numbers of sites.

Some Late Horizon characteristics not recorded in figures 5 and 6 all refer to contrasts with Middle Horizon, that is, a lesser use of red ocher in the burial complex but greater use of baked clay objects than before, and more importance in acorn gathering and preparation than in Middle Horizon (Delta region). Preinterment grave-pit burning (fig. 6, XX), described as burning of basketry and other offerings in graves before the body itself was deposited, became a common practice in Late Horizon, Phase 1. The small, side-notched projectile points, often of obsidian, suggest appearance of bow and arrow, probably supplanting use of heavier dart points with atlatl.

The traits enumerated for the Diablo District in Late Horizon, Phase 1 (fig. 6) can serve as well to describe the Cosumnes District in the lower Sacramento Valley during the same period of time. However, differing environments in the two regions, Bay and Delta, account for several persistent distinctions among the several districts involved, such as the use of wooden mortars and baked clay objects in the interior and the virtual absence of these in the coastal lands, where more stone was available for artifacts.

Beyond these easily explainable differences there were other circumstances for which no ready accounting can be offered. One of these may be seen in the Alameda District in the latter part or Newark facies of Phase 1 (fig. 5). Here and at other sites of the same time level on parts of San Francisco Bay some unknown factors seem to have brought about a desertion of settlements or relatively sudden movement of population. It has been assumed that a migration of some sort probably took place from large village sites, such as Ala-328, to smaller ones in the surrounding area.

Chart by J. A. Bennyhoff, 1972.

Fig. 5. Late Horizon, Phase 1, Alameda District: Significant artifact types and temporal changes, from Ponce facies (Middle-Late Horizon Transition) to Newark facies (Late Phase 1). Olivella beads shown approximately actual size; relative scale attempted for remainder within related groups but not between different classes. Position of specimens shown within facies has no chronological significance. Bead typology from Lillard, Heizer, and Fenenga 1939. C, *Haliotis cracherodii*; N, known only in northern (e.g., Carquinez Straits) region; S, known only in south (San Francisco) Bay region.

1-11, Olivella beads: 1. Rectangular, end-perforated, Type 2a2; 2,3. Rectangular, centrally perforated, Type 2a1; 4. Same as 2,3, "narrow variant"; 5. Same as 2,3, "wide variant"; 6. Same as 2,3; 7. Split-punched, Type 3a2; 8. Spire-lopped; 9. End-ground; 10. Cupped, Type 3e; 11. Modified "saddle," Type 3b2. 12. Steatite bead. 13-16. Haliotis ornaments, normally *H. rufescens*. 17. Simple flexed burial. 18. Bird-bone whistle, with end stop. 19-21. "Piled" charmstones. 22. Quartz crystal. 23-26. Tubular smoking pipes, usually steatite (note bead appliqué on collared pipe, No. 25). 27,28. Obsidian spear points. 29,30. Obsidian arrow points. 31,32. Obsidian dart points. 33. Obsidian knives. 34. Antler flaker. 35,36. Bone harpoons. 37. Perforated discoidal. 38. Serrated mammal scapula. 39. Cannon bone awl. 40. Shaped stone mortar. 41,42. Stone pestles.

Marin District

No Early Horizon sites such as those proposed for San Francisco Bay's Berkeley facies have yet come to light in the Marin District, which is defined here as comprising practically the entire Marin County littoral, including a substantial portion of shore on northern San Francisco Bay. One site on the bay, Mrn-138, probably of McClure facies (equated temporally with Castro facies in Alameda District, fig. 3), has a carbon-14 date of about 700 B.C. (I-5797).

Notable similarities of McClure facies with Middle Horizon facies on San Francisco Bay or the Delta region are seen in (1) bone ornaments and implements such as hairpins, whistles, bipointed gorge hooks, forked "head scratchers," mesh gauges (for fish nets?), triangular shaped antler or bone spatulae, ringed or "eyed" daggers or pendants; (2) mica ornaments; (3) abundance of red ocher with burials; (4) olivella beads, Type 3c ("sauce"); (5) haliotis ornaments, rectangular, with end perforation; (6) flexed burial position, although loose flexure rather than tight was more characteristic of Marin District than either Alameda or Cosumnes; (7) heavy, nonstemmed chipped points, with greater ratio of nonobsidian to obsidian used for these points than in subsequent (Late Horizon) facies; (8) grooved or notched stone sinkers—frequent in Berkeley facies.

Distinctions of Marin District, specifically noted for McClure facies, are (1) basin-shaped structures of baked earth in midden deposits; (2) markedly curved, chipped obsidian objects—"eccentrics"; (3) human figurines of baked clay (fig. 7).

Cauley facies, assigned to later Middle Horizon, shares a number of traits with its predecessor, McClure, but is distinguished by several characteristics. First, the olivella beads are Type 3b2, the modified "saddle" shape. Second, there is evidence of head taking in the form of detached skulls in burial; this trait is present in Early Horizon and again in ethnographic times in Central California. Cauley facies also shows the earlier McClure characteristic of baked clay human figurines. Both McClure and Cauley are remarkable for their scarcity or total lack of shell beads and haliotis ornaments. The ex-

The Mendoza facies, the Late Horizon, Phase I representative of Marin District, presents certain enigmas as far as association with any specific facies of the Bay or Delta regions is concerned, especially since olivella shell beads, which serve as definite time markers for the Bay-Delta facies, are lacking.

Colusa District

burial position, tubular stone pipes with flanges, and small side-notched obsidian points.

Several traits from Cosumnes District such as flat-bottomed, shaped mortars and complete cremations did not penetrate to the north. Use of shaped baked clay objects from Cosumnes entered Colusa District but seemingly never achieved much importance. Moreover, a number of practices common to the Delta during Phase 1, such as preinterment grave-pit burning, deep angular serration of obsidian points, and incising of bird-bone tubes, did not appear in Colusa District until Phase 2. This has given rise to the supposition that there was a migration at some time from the south to the comparatively poor region of the north.

Napa District

It is evident that the prehistoric populations of the Napa Valley and environs had close ties with both San Francisco Bay and Sacramento-San Joaquin Delta regions (Heizer 1953).

At least two sites (Nap-129 and Nap-131, fig. 1) have been suggested, on the basis of artifacts like manos, basalt core tools, and concave-based, fluted points like those from Borax Lake, as equatable with Early Horizon in Central California.

Investigations at several stratified sites (for example, Nap-1, Nap-32—see fig. 1) have indicated that Middle Horizon is represented in the lower levels, principally by: flexed burials; "saucer" and "saddle" olivella beads, Types 3c and 3b1; probably nonserrated, nonstemmed obsidian points, of which the sequential picture of the specimens is not altogether clear, since they do not have burial association data; circular ear plugs (?) of stone, of a type found in Middle Horizon contexts in San Francisco Bay sites (but in both Middle and Late in Sacramento Valley as well); reworked obsidian prisms—"ban-

Chart by J. A. Bennyhoff, 1972.

Fig. 6. Late Horizon, Phase 1, Diablo District: Significant artifact types and temporal changes. Olivella beads shown approximately actual size; relative scale shown for projectile points; other classes of artifacts not to scale. Position of specimens within subphases has no significance except for projectile points. Approximate order of artifacts represented, from left to right: 1. Olivella beads; 2. Haliotis ornaments (note that first appearance of heavy incision on many ornaments is in Middle-Late Horizon Transition); 3. Charmstones; 4. Stone pipes; 5. Decorated bone ear tubes and whistles; 6. Stone projectile points; 7. Bone harpoons. Legend: Ab, bone awls; Bw, bone whistles; C, "cupped" olivella beads; D, dart point (undesignated points are presumed arrow points); Fg, Fishhook or gorges of wood (top), shell, and bone (bottom); Ft, antler tine flaker; Fu, bone (ulna) flaker; G, ornaments worn as girdle; H, bone hairpin; K, stone knife; L, trait carries over to Phase 2, Late Horizon; M, stone mortar and pestles; P, ornaments usually found paired in mirror image; S, spear point; Sd, stone discoidal, perforated; T, trait appears for first time in Transition phase, between Middle and Late Horizons; W, stone pestle for use in wooden mortars; We, whole end-ground olivella bead; Ws, whole spire-ground olivella bead; Wsg, whole side-ground olivella bead; XX, flexed burial position (27% grave pit burning; 32% have northwest orientation).

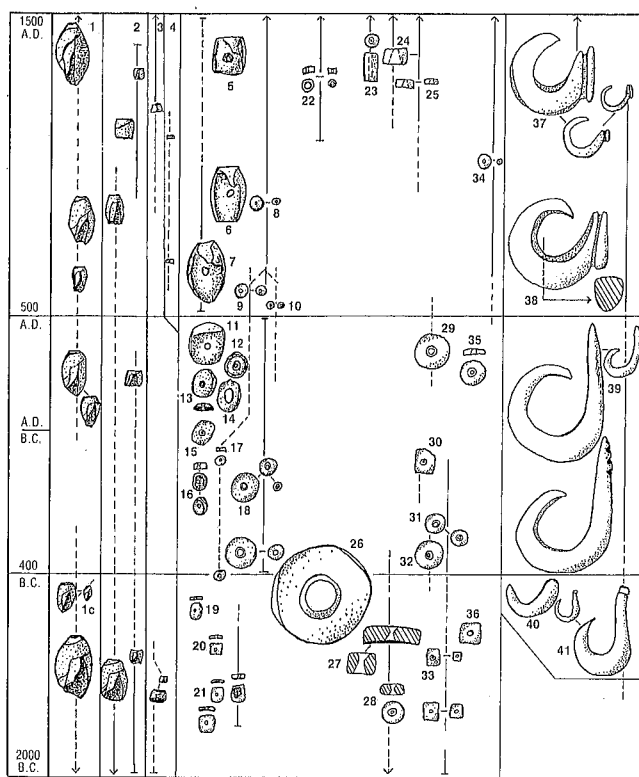


Chart by Chester King, 1972.

Fig. 9. Southern California Coast shell beads and single-piece fishhooks. Dashed lines show possible temporal range; solid lines indicate more confident estimates of range or relationship of types. Arrows denote survival from or extension to earlier and later time period. Bead typology from Lillard, Heizer, and Fenenga 1939.

1-22, *Olivella* beads: 1. Whole spire-looped, Types 1a, 1b (small and large), and 1c (diagonally ground); 2. "Barrel-shaped," spire and base ground, Gifford's (1947) Type G1a; 3. Gifford's Type G1b, more of base ground off than in Type G1a; 4. Gifford's Type G1c, cuplike bead made from spire; 5. Rectangular, split-punched, Type 3a3; 6. Split, but with perforation made by grinding convex surface of wall, Type 3a variant; 7. Split-punched, Type 3a2; 8-10. Variants of small disk, Type 3d; 11. Split, drilled, Type 3b1; 12. Round "saddle," Type 3b variant; 13. Oval "saddle," Type 3b variant; 14. Rare type, shaped like small contemporary limpet ornaments; 15. Modified "saddle," Type 3b2; 16. Unique, with convex surface ground and drilled perforation; 17. Small disk, Type 3e variant, with some examples ground flat; 18. "Saucer," Type 3c; 19. Rectangular, with rounded edges and lenticular cross-sections, Type 2b (?); 20. Rectangular, Type 2b; 21. Rectangular, sometimes ground on concave surface, Type 2b; 22. Cupped, Type 3e. 23-28, *Tivela* sp. beads and ornament: 23. Small cylinder; 24. Thick disk; 25. Thinner disk; 26. Large ring bead or ornament; 27, 28. Disks. 29-33, *Haliotis* sp. disk beads: 29. Circular, Type 3; 30. Rough rectangular (amorphous) Type 4; 31, 32. Circular, Type 3, note size range; 33. Small rectangular, Type 1a. 34-36, *Mytilus* disk beads, circular and rectangular. 37-41, Shell and bone fishhooks: 37. *Mytilus*-*haliotis* hooks (not shown) of this type usually have shorter shanks than most *Mytilus* specimens; 38. Rare bone type, with grooved shank; 39. *Mytilus*, with plain and notched shanks—hooks of these types are also made of *haliotis* and bone; 40. *Haliotis* with undefined shank; 41. Bone, with knobbed shank—some hooks of this type also occur in shell.

protohistoric levels. *Glycymeris* shell beads or ornaments found in Redding District (fig. 8k) do not appear characteristically in archeological deposits in coastal Northwestern California, although they were used there in ethnographic times. These point to another possible postcontact diffusion into the Redding District.

The hopper slab acorn mortar is widely distributed among ethnographic groups of northern California. It is characteristically present in many prehistoric sites of Redding District, but its ultimate place of derivation remains indefinite. Examples on the Columbia River (Strong, Schenck, and Steward 1930:pls. 22e, 26a) are not definitely dated, and the Southern California distribution does not extend through Central California in Phases 1 or 2, Late Horizon.

One exaggeratedly large ceremonial obsidian blade was found in a burial associated with clamshell beads at site Teh-58 in Redding District. The specimen is similar to blades known among the ethnographic Yurok and is probably the largest such blade ever found archeologically in California. The obsidian itself probably came from Modoc County, near the present California-Oregon border, and the trait is suggested as indigenous to Northern California, perhaps first developing among the prehistoric Yurok.

Pine-nut beads (fig. 8l) are so common in both Northwestern California and Redding District that independent indigenous development in each region may easily be inferred, although such beads are known elsewhere, even as far distant as the Humboldt Valley in western Nevada (Heizer and Krieger 1956:26) where they are classed as trade items.

Incised mammal-bone pendants (fig. 8i) from Redding District have their counterparts in specimens from Northwestern California, where they have been referred to as head scratchers, louse killers, and the like (Loud 1918:pl. 20). In view of the apparently advanced development of bone working on the Coast, it seems likely that the Redding specimens ultimately were derived therefrom.

So-called charmstones in most of the Redding District are of the type recorded for the ethnographic Wintu by Du Bois (1935). They are curiously shaped stones, fossilized bones, or at most undeveloped spindle-shaped objects. Although such odd stones may be found in almost any archeological site in Central California, it is noteworthy that with one exception these Redding examples do not seem to cooccur there with the finely shaped charmstones found in Late Horizon in the Sacramento River Delta region. The exception is seen in Round Valley, where phallic-shaped stones reminiscent of, but by no means identical with, lower Sacramento Valley types have been found. In both Marin District and the Napa region phallic charmstones were found in Late Horizon contexts.

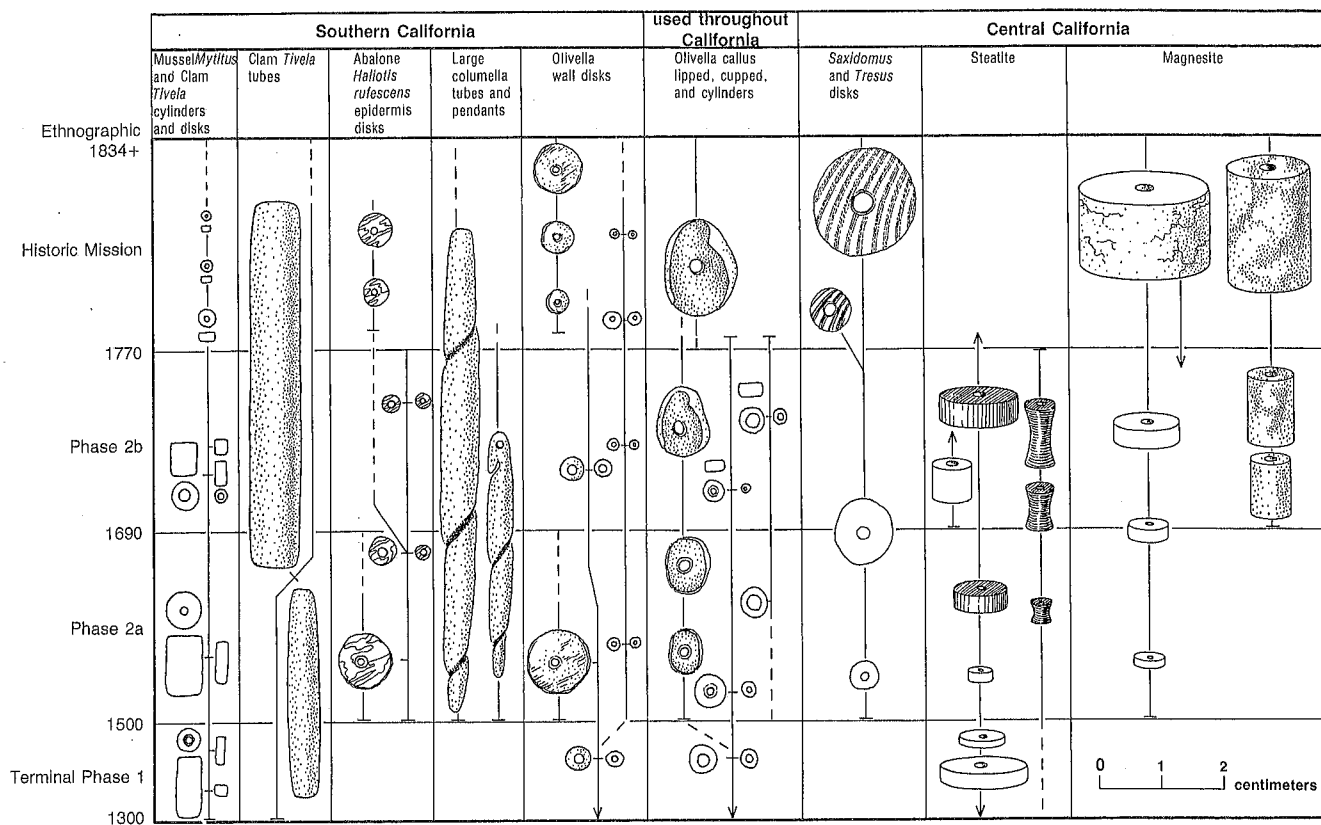


Fig. 2. Common California protohistoric and historic beads.

archeological components that are probably contemporary.

The ethnographic literature is relatively complete in specifying the precise form of beads and ornaments used about 1834 (fig. 2) and after. The ways beads were worn (fig. 3) are essentially analogous to those described a century later for the Central Sierra Miwok by Barrett and Gifford (1933). For southern California, Harrington (1912-1923) and Strong (1929) described beads used. Ethnographic and historic data concerning the uses of these beads have been tested against the associations of bead types in mortuary contexts and partially confirmed. For example, different types were associated with burials of different statuses (see L.B. King 1969:56-60).

The callus (or columella) of the *Olivella biplicata* is composed of a high proportion of enamel and is very hard. Only one callus bead could be made from each shell (fig. 4), and the size of the bead was determined to a large degree by the amount of work spent in grinding it down. The beads produced from the callus are rather inconspicuous in comparison with the amount of work expended in their manufacture. Lipped olivella callus beads are found in the Chumash area either singly or in low numbers in lots or occasionally in high frequencies sewed on bags or in long strands. Used over a large area of California (fig. 5), these were evidently one of the less valuable "money" beads.

The columellae of univalves larger than *Olivella* sp. were shaped into pendants or longitudinally drilled tubes



NAA, Smithsonian.

Fig. 3. Costanoan man wearing shell necklace and shell beads attached to headdress. Lithograph (Choris 1822) based on lost watercolor by Louis Choris, 1816.